

EXHIBIT F

EXHIBIT 26



**IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA
NORTHERN DISTRICT**

Stephen Adkins and others similarly situated,

Plaintiff,

V.

Facebook, Inc.,

Defendant.

No. C 18-05982 WHA (JSC)

DECLARATION OF IAN RATNER, CPA, CA, CBV, CPA/ABV, ASA, CFE

1. My name is Ian Ratner and I am a Principal and co-founder of GlassRatner Advisory and Capital Group, LLC ("**GlassRatner**"), a multi-office specialty financial advisory services firm headquartered in Atlanta, Georgia, U.S.A. that provides services primarily relating to: forensic accounting and litigation support; bankruptcy and restructuring; and business valuation. I am a resident of Fulton County, Georgia and I am over twenty-one years of age. I have personal knowledge of the facts stated herein unless otherwise stated. For my work as an expert in this matter, I am being compensated at \$595 per hour.

I. Qualifications

2. I am a Certified Public Accountant (“**CPA**”) licensed in Georgia and also hold the specialty designation Accredited in Business Valuations (“**ABV**”) granted by the American Institute of Certified Public Accountants (“**AICPA**”). Further, I am a Chartered Professional Accountant (“**CA**”) in Ontario, Canada and hold the designation Chartered Business Valuator (“**CBV**”) governed by the Canadian Institute of Chartered Business Valuators. In addition to the above, I have been designated as an Accredited Senior Appraiser (“**ASA**”) by the American Society of Appraisers and hold the designation Certified Fraud Examiner (“**CFE**”) granted by the Association of Certified Fraud

Examiners. In 2010, I became a Fellow of the American College of Bankruptcy. I hold an undergraduate degree in Business and a graduate degree in Accounting from McGill University in Montreal, Canada. I have approximately 30 years of experience in Public Accounting, Forensic Accounting—including the quantification of Economic Damages, Business Valuations, Due Diligence Services, Corporate Finance, and Bankruptcy Consulting. I have attached my Curriculum Vitae as **Appendix 1** to this Declaration which sets out additional information about my qualifications. Finally, I have testified as an economic damages expert on dozens of occasions, including matters relating to data breaches, and have been accepted as an Expert in State and Federal courts. A list of my prior testimony is attached as **Appendix 1**.

II. Data Breach Background¹

3. On September 28, 2018 Facebook, Inc. (“**Facebook**”) announced a previously unreported attack on its network that exposed the personal identifying information (“**PII**”) of nearly 30 million users (hereinafter referred to as the “**Data Breach**”).² PII can include information that identifies, relates to, describes, is capable of being associated with, or could reasonably be linked, directly or indirectly, with a particular consumer or household.³ The Plaintiff alleges that Facebook’s users have suffered injury as a result of Facebook’s negligence, in the form of lost money or property, lost asset value, the value of lost time spent dealing with the Data Breach, increased nuisance, and increased risk of identity theft.⁴

4. I understand that Facebook has since acknowledged that PII for nearly 29 million users (the “**Class**”) was exposed in the Data Breach. For 15 million of these Class members, the PII exposed by Facebook included the user’s email address and phone number (referred to as “**Group 1**”).⁵ For the remaining 14 million Class members, more comprehensive profile information, i.e., a much longer list of PII components was exposed, which includes the following (referred to as “**Group 2**”):⁶

¹ Unless otherwise specified, the facts as cited in the background are based in large part on the Class Action Complaint (the “**Complaint**”), dated September 28, 2018. The Complaint was filed on behalf of the Plaintiff by Co-Lead Counsel (“**Co-Lead Counsel**”). I have not been retained to perform a liability investigation or validate the allegations in the Complaint. The items described in the Background are for information purposes and to frame the matter. Counsel amended this Complaint on August 16, 2019.

² Complaint.

³ The California Consumer Privacy Act of 2018.

⁴ Amended Class Action Complaint, August 16, 2019.

⁵ Declaration of Christopher Bream in Support of Defendant Facebook, Inc.’s Motion to Dismiss the Consolidated Class Action Complaint, March 14, 2019.

⁶ Declaration of Christopher Bream in Support of Defendant Facebook, Inc.’s Motion to Dismiss the Consolidated Class Action Complaint, March 14, 2019. I understand that a Group 3 of users was also

Table 1
Components of PII Exposed for Group 2

User name	Hometown	Friendships
Full name	Address	Relationship status
Gender	Location histories	Religious views
Date of birth	Browsing history	Education
Telephone number	Facebook history	Employment
Email address	Devices used	

III. GlassRatner's Mandate and Summary Conclusions

5. GlassRatner was retained in October 2018 by Co-Lead Counsel on behalf of the Plaintiff to evaluate their damages, if any. Specifically, we were asked to consider how to determine damages as a result of Facebook's negligence. We calculated two categories of damages including the Class members' time spent associated with the Data Breach and increased risk of loss as a result of the Data Breach ("**Time and Risk Damages**"), and the damages as a result of Facebook's unauthorized exposure of the Class members' PII ("**PII-Based Damages**").⁷

6. The opinions and observations noted herein are based on our research, education and experience working on data breach litigation matters related to the Data Industry.⁸ Further, **Appendix 2** lists the documents and information relied on by GlassRatner.

7. For the Time and Risk Damages, our findings include the following:

- The value of time spent by the Class as a result of the Data Breach is between \$18-20 per hour, thus, for Mr. Adkins, who spent 1.8 hours responding to the Data Breach, his damages would be between \$32.50 and \$36.30 (see **Schedule 1**). In addition, the value of time required by Class members to deal with actual fraud—to the extent that such has been demonstrated—resulting from the Data Breach is between \$433 and \$484 per incident (see **Schedule 2**).

identified, but Facebook claims the PII at issue was similar to Groups 1 and 2. See FB-Schmidt-00000198 at'212.

⁷ GlassRatner's scope of services is limited to the assessment described above under a represented Data Breach. The existence of the Data Breach and its causes are outside the scope of our services in this matter.

⁸ The Data Industry refers to companies whose value is primarily driven by data as the underlying asset.

- The value of the increased risk resulting from the Data Breach to each Class member is between \$1,005 and \$1,513 per Class member assuming the risk for the Class will last for at least 5 years (see **Schedule 3**).⁹ At 5 years, the present value of the increased risk and stress would be between **\$1,045** and **\$1,574** per Class member (see **Schedule 3**).
8. For the PII-Based Damages, our findings include the following:
- For Group 1, the damages as a result of Facebook allowing access to the PII at issue is between \$15 million and \$35 million (see **Schedule 4**).
 - For Group 2, the damages as a result of Facebook allowing access to the PII at issue is between \$56 million and \$87 million (see **Schedule 4**).

IV. Facebook Background and Its Use of PII

9. Defendant, Facebook is a Delaware corporation, with its principal place of business and headquarters in Menlo Park, California.¹⁰ Facebook is one of the world's largest data information companies.¹¹ Facebook's business model is driven by the data it collects and uses to generate revenue.

A. Facebook's Business Model

10. Facebook generates substantially all of its revenue through the sale of advertising that permits marketers to reach Facebook's users based on PII provided by users that includes a variety of factors, including age, gender, location, interests, and behaviors.¹² Thus, Facebook's revenue, profits, and market capitalization are ultimately contingent upon the PII provided by Facebook's users.

11. Facebook is a services business that is fueled by data. Facebook's business model digitizes and monetizes information that is gathered from its users and shared with its advertising business partners. Their business model is depicted in the following simple graphic:

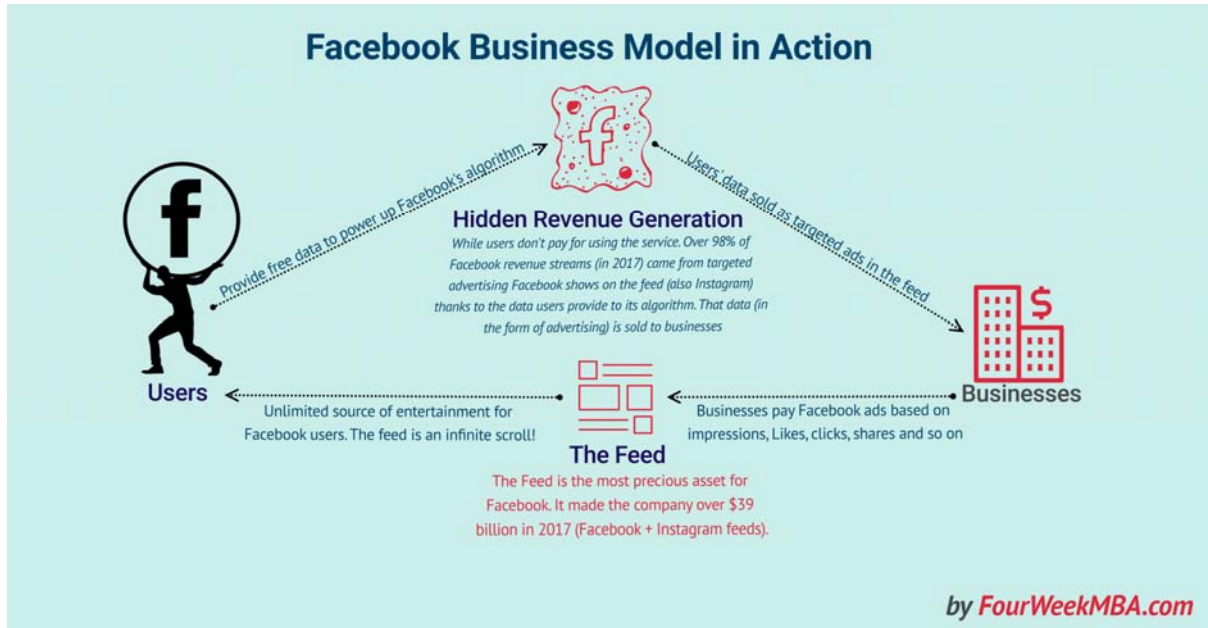
⁹ Declaration of James Van Dyke dated August 29, 2019.

¹⁰ Facebook, Inc. Annual Report 2017.

¹¹ For SIC Code 7375, Information Retrieval Services, Facebook is the 2nd largest company, behind only Google. (Capital IQ).

¹² Facebook, Inc. Annual Report 2017.

Figure 1



12. Figure 1 portrays an agreed-upon exchange of value between Facebook and its users. Users provide Facebook access to personal information in exchange for gaining access to Facebook's social media platform.

B. Facebook's Revenue, Earnings and Market Capitalization

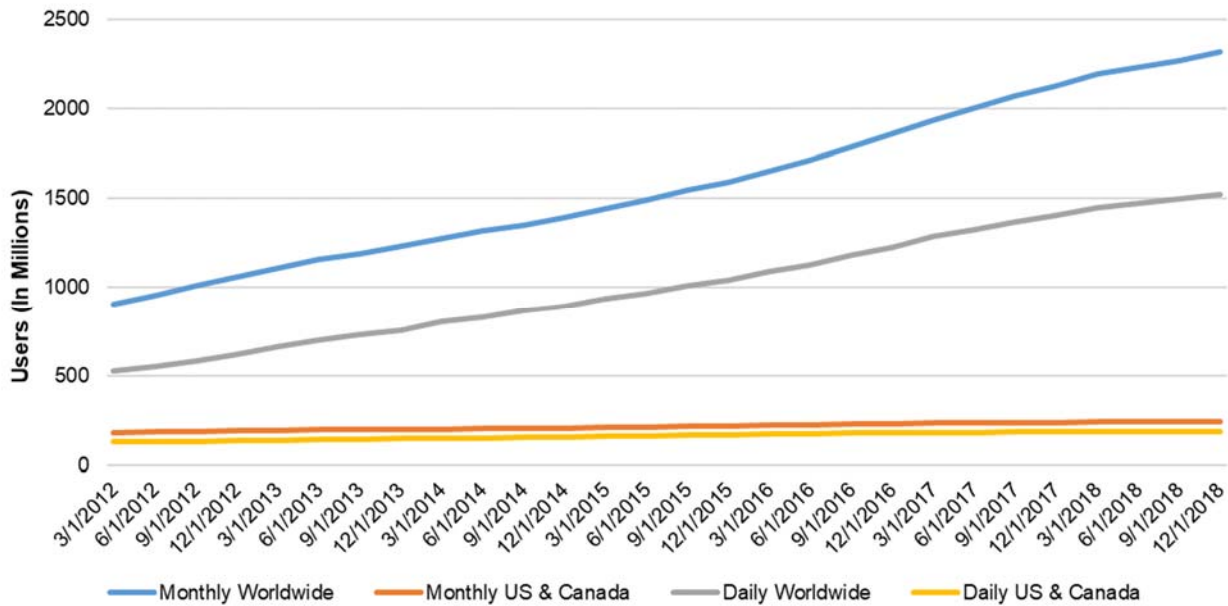
13. From 2012 to 2018, Facebook increased its revenue from \$5.1 billion to \$55.8 billion per year (an annual growth rate of approximately 50%) and its after-tax net profit from \$53 million to \$22.1 billion (see **Schedule 5**). Before the Data Breach was announced on September 28, 2018, Facebook had a market capitalization of \$487.5 billion. Facebook's market capitalization dropped to \$474.8 billion after the Data Breach was announced—a drop of \$12.7 billion (see **Schedule 6**). At this time, we have not isolated all of the potential reasons contributing to this drop in market capitalization after the Data Breach was announced.

C. Growth of Facebook's Users

14. From 2012 to 2018, Facebook increased its users from 980 million to over 2.2 billion. As shown in the following chart, approximately 10% to 15% of these users are in the United States (see **Schedule 7**):

Figure 2

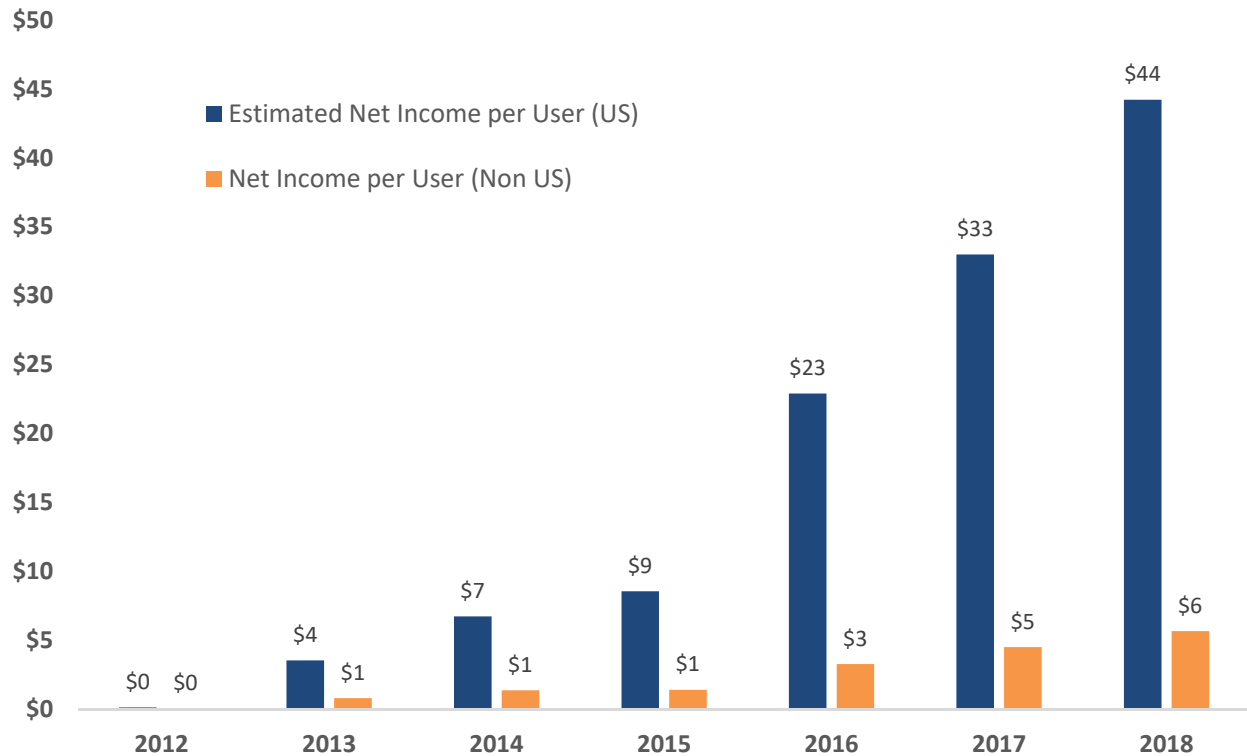
Facebook Active Users 2012 through 2018



15. As mentioned above, these users are extremely valuable to Facebook because of how Facebook monetizes its users' PII through the sale of targeted advertising to Facebook's advertising customers. As of the end of 2018, Facebook generated annual revenue of \$231 per U.S. user and \$28 in annual revenue per non-U.S. user (see **Schedule 8**). As of the end of 2018, Facebook generated net income of \$44 per U.S. user and \$6 in net income per non-U.S. user, as shown in the following figure (see **Schedule 9**):

Figure 3

Growth in Facebook Net Income per User (2012 – 2018)



16. In terms of total company value, Facebook’s U.S. users contributed over \$753 each to the market capitalization as of the end of 2018, whereas non-U.S. users contributed \$97 each to Facebook’s market capitalization (see **Schedule 10**).

V. The PII that Facebook Relies on Is Valuable

17. Without question, the PII contributed to Facebook by the Class is valuable. In general, this type of PII has driven billions of dollars of revenue and profits for the growing data industry. In addition, the value of PII can be clearly demonstrated and corroborated through an analysis of Facebook’s behavior with respect to PII (i.e., Facebook’s data-based profits, amounts spent protecting PII, and amounts spent acquiring PII).

A. Growth in the Data Industry Demonstrates the Value of PII

18. The “data industry” business model has evolved from simply monetizing user-generated content to creating platforms offering “an infinite stream of content, capable of delivering a broad

range of media and ad formats ideally suited for mobile consumption.”¹³ This evolution in the data industry has created tremendous value.

19. Data has been referred to as “the oil of the digital era” with the top players in the data industry dominating as some of the most valuable and profitable firms in the world.¹⁴ This Data Industry now generates combined annual revenues of approximately \$300 billion dollars.¹⁵ The largest players in the data industry include: Alphabet, Inc. (Google), Facebook, Tencent, Baidu, Twitter, Inc., NAVER Corporation, IAC/InterActiveCorp, Yahoo Japan Corporation, Weibo Corporation, and Match Group, Inc.¹⁶

20. Facebook requires and gathers significant user information to carry out its business model, and views information as a valuable asset worthy of significant legal and security protections. Inherent in this business model’s data exchange success is that both parties agreed to abide by a set of “rules”. Based on those “rules”, Facebook’s users have an expectation that their data would remain private.¹⁷ Facebook recognizes the value and sensitivity of user data as evident by providing its users platform capabilities to limit the distribution of certain information such as phone numbers, email addresses, friend lists, and posting locations.

21. The Data Breach resulted in the exposure of sensitive and valuable PII. Revenue for data industry companies and the underlying PII maintained by data industry companies are inextricably linked.¹⁸ In other words, if Facebook does not maintain the privacy of its users’ PII, it risks losing those customers and the ability to generate revenue from those customers. Although Facebook does not pay its users for the PII that its users contribute, it would be incorrect to conclude that users contribute their data for free. Rather, the data provided by Facebook’s users is the modern-day currency used in the transaction for the services that Facebook provides. PII is unquestionably

¹³ See Evercore ISI Report, December 5, 2017.

¹⁴ See <https://www.economist.com/leaders/2017/05/06/the-worlds-most-valuable-resource-is-no-longer-oil-but-data>.

¹⁵ See <https://edition.cnn.com/2012/08/23/tech/web/big-data-axiom/>.

¹⁶ See <https://www.capitaliq.com/CIQDotNet/Lists/QuickComps.aspx?listObjectId=259698387&tabId=1>.

¹⁷ Facebook’s published User terms: “You own the content you create and share [emphasis added] on Facebook and the other Facebook products you use, and nothing in these Terms takes away the rights you have to your content. [emphasis added] You are free to share your content with anyone else, wherever you want. To provide our services, though, we need you to give us some legal permissions to use that content.” [emphasis added] <https://www.facebook.com/terms.php>

¹⁸ Glikman, Pauline and Gladly, Nicolas, *What’s the Value of Your Data?*, TechCrunch, October 13, 2015. <https://techcrunch.com/2015/10/13/whats-the-value-of-your-data/>.

a valuable asset to both Facebook and its users. In a simple sense, if it were not valuable, companies would not spend the funds they do to secure it.

B. Facebook's Behavior with Respect to PII

22. Facebook's business model generates enormous profits through the use of this PII. In addition, Facebook's behavior with respect to its users' PII data demonstrates the value that Facebook itself puts on this information. Facebook spends large amounts of money securing this PII. Lastly, Facebook has also spent significant sums acquiring new PII.

1. Evidence of PII value: Facebook profits from its users' data

23. Based on its market capitalization, Facebook is one of the largest companies in the world. Facebook has generated billions of dollars of revenue and profits from the very PII at issue in this matter.

24. Moreover, Facebook is a business built on a base of working capital, tangible assets (such as buildings, IT equipment, and software), and intangible assets (such as its brand, trade names, employees, its business partners, and the content (information or data) that it processes and displays to its users). While ownership of these assets can be either created or secured on demand through the expenditure of money, the intangible "data" asset is different. Facebook does not own its users' data, rather users provide the data on a royalty-free basis in exchange for the services provided by Facebook. This data is continuously changing and updated as users interact with the Facebook platform. Gaining access to user information thus invokes a commitment on the part of Facebook to continuously safeguard the information that is repeatedly entrusted to their care.

25. Facebook's obligation to carry out this customer commitment has led to tremendous shareholder wealth creation. Facebook has options and choices for the location of its facilities, vendors for its equipment, what talent to hire, and on how to build its algorithms. However, Facebook has very limited options in building its user database (i.e., it must acquire that data from its users). To preserve the value of this database, Facebook must fulfill its duty to treat its users and their information with a level of expected care.

26. After the announcement of the Data Breach, Facebook's market capitalization decreased by \$12.7 billion as Facebook's underlying assets that support its market capitalization had

declined.¹⁹ Comparing Facebook's book value (approximately \$92 billion related to its owned assets) to its market capitalization (\$487.5 billion; a figure well in excess of the book value of its owned assets) indicates that \$395 billion in value is attributable to off-book assets (see **Schedule 11**). It is clear that the majority of Facebook's value is attributable to its intangible and off-balance sheet assets.²⁰

2. *Evidence of PII value: Facebook spends significant money to protect data*

27. Prior to the Data Breach, Facebook spent large sums of money to protect its users' data. In its 2013 Annual Report to Shareholders, Facebook made the following statements:

We dedicate significant resources to the goal of building user trust through developing and implementing programs designed to protect user privacy, promote a safe environment, and assure the security of user data. The resources we dedicate to this goal include engineers, analysts, lawyers, policy experts, and operations specialists, as well as hardware and software from leading vendors and solutions we have designed and built.

We invest in technology, processes, and people as part of our commitment to safeguarding our users' information. We use a variety of techniques to protect the data that we are entrusted with, and we rely on multiple layers of network segregation using firewalls to protect against attacks or unauthorized access. We also employ proprietary technologies to protect our users.

28. In 2018, Facebook's selling, general, and administrative expenses were \$11.3 billion (see **Schedule 12**). A portion of this amount was spent on providing security protections for its users' data. According to congressional testimony offered by Facebook's General Counsel, Facebook, in 2017, had 10,000 employees dedicated to safety and security concerns and was seeking to double that amount.²¹ The annual costs of approximately 10,000 personnel are estimated at between \$1.0 billion and \$2.1 billion (see **Schedule 13**).²² If Facebook does indeed double this amount, then the estimated cost—just for its personnel would double as well. According to documents produced by Facebook, it currently spends between \$200 million and \$300 million on data security and privacy

¹⁹ There does not appear to be any other significant announcements or activity on September 28, 2018 that would explain Facebook's stock price decline.

²⁰ Other intangible assets would include the technology on which Facebook's platform is based and its relationships with advertisers. However, it is Facebook's access to user PII that is the primary revenue generating asset for Facebook.

²¹ Hearing before the United States Senate Committee on the Judiciary Subcommittee on Crime and Terrorism: Testimony of Colin Stretch, General Counsel, Facebook, October 31, 2017.

²² Calculations found Data Security Salaries provided by ZipRecruiter at \$90,041 per year and GlassDoor at \$122,500 per year (with an incremental 30% burden rate applied for the cost of benefits).

issues (see **Schedule 20**). A party such as Facebook logically only spends material sums of money to protect assets that have significant value.

29. In addition, I understand that Facebook recently agreed to pay a \$5 billion fine and agreed to improve its privacy and security policies as a result of Federal Trade Commission (“FTC”) investigations into Facebook’s recent data-breach activity.²³ As part of the FTC settlement, Facebook agreed to accept greater oversight of its privacy practices, form a privacy committee, and certify that it is complying with the FTC agreement. The amount of the fine and the extent of actions that Facebook has agreed to implement going forward highlight both the importance and value of PII to Facebook and the public who has entrusted its PII to Facebook.

3. Evidence of PII value: Facebook buys companies to get access to users, data, and capabilities

30. As further corroboration of the value of PII to Facebook, it willingly spent enormous sums for access to new users and the new PII that it can exploit for profit. Two notable Facebook acquisitions since 2012 include Instagram and WhatsApp. In April 2012, Facebook acquired Instagram, which is a photo and video-sharing social networking service, for \$1 billion dollars.²⁴ Facebook essentially paid \$33.7 per Instagram user (see **Schedule 14**). In February 2014, Facebook purchased WhatsApp, which is a messaging service that allows people to connect via their cellphone numbers and is the most popular App for mobile devices.²⁵ Facebook paid approximately \$20 billion dollars for WhatsApp, equating to a value of roughly \$44.7 per user (see **Schedule 14**). These significant per-user amounts paid by Facebook indicate that it was willing to invest heavily in acquiring users and the potential incremental data that adding such users would bring. By comparison, these amounts are much lower than its global market capitalization per user, which was over \$250 per user by the end of 2017.²⁶

²³ <https://www.wsj.com/articles/facebook-agrees-to-pay-5-billion-in-ftc-settlement-11563971400>. Accessed July 24, 2019.

²⁴ See <https://www.forbes.com/sites/bruceupbin/2012/04/09/facebook-buys-instagram-for-1-billion-wheres-the-revenue/#221b365b4b8a>.

²⁵ See <https://money.cnn.com/2014/02/19/technology/social/facebook-whatsapp/index.html>.

²⁶ Calculated based on total market capitalization of over \$522 billion as of December 2017 and total users in excess of 2 billion.

VI. Time and Risk Based Damages

31. As mentioned above, due to Facebook's negligence, its users have been harmed in a number of ways. These include damages as a result of the time spent by Class members and increased risk due to the Data Breach (discussed in this section) and lost money, profits and value as a result of the Data Breach (discussed in the next section).

32. For the Time and Risk damages, I have calculated two categories of damage, including: (1) the time value of dealing with the Data Breach, and (2) the value of the increased risk, stress, nuisance, inconvenience, and annoyance of identity theft.

A. Time Spent Dealing with Consequences of the Data Breach

33. Victims of data breaches often must spend time dealing with the after effects. Identity theft experts recommend that data breach victims spend time performing multiple steps after the announcement of a data breach. These steps include, (1) researching the data breach, (2) changing passwords, (3) checking credit reports, (4) monitoring accounts, (5) obtaining identity theft protection, and (6) filing taxes early.²⁷ Performing these steps require the expenditure of time and effort. For example, Plaintiff Stephen Adkins spent approximately two hours logging back in to Facebook, changing passwords, attempting to detect identity theft, and attempting to prevent identity theft.²⁸ Time spent on such activities has a clear value and can be measured.

34. One method that can be used to value the time spent by the Class members dealing with the Data Breach is to determine the rate one would have to pay a specialist²⁹ to perform the tasks that the Class members would otherwise have to perform. Because the tasks performed by all the Class members were similar, the rates for a specialist will be similar for the entire Class (i.e., time spent dealing with the problems created by the Data Breach), and this would be a reasonable and appropriate valuation method.

35. The first step using this method is to determine the rate at which members of the Class could hire a specialist to address their Data-Breach related issues. The Plaintiff could hire an

²⁷ See, for example, <https://www.lifelock.com/learn-data-breaches-steps-to-take-right-after-a-data-breach.html> and <https://www.daveramsey.com/blog/data-breach-impacts>.

²⁸ Deposition of Stephen Adkins, pp. 422-424.

²⁹ A person with a demonstrated aptitude and requisite knowledge to efficiently deal with the task at hand.

administrative assistant or financial specialist to handle the disputed activity, for approximately \$18-\$20 per hour, as shown in the following table:³⁰

Table 2

Hourly Rates for Relevant Specialists

Occupation Code	Occupation Title	Median Hourly Wage	Mean Hourly Wage
13-2000	Financial Specialist	\$22.69	\$27.67
43-3031	Bookkeeping, Accounting, and Auditing Clerks	\$17.08	\$18.22
43-6010	Secretaries and Administrative Assistants	\$16.73	\$18.73
43-6014	Secretaries and Administrative Assistants (except Legal, Medical)	\$15.72	\$16.04
Average		\$18.06	\$20.17

36. The formula for calculating the value of time spent by Class members on dealing with the the Data Breach would be as follows: (1) the total number of hours spent per Class member, multiplied by (2) the hourly rate for the value of that time spent (\$18-\$20 per hour). As an example, for Mr. Adkins, who spent 1.8 hours on these activities (see **Schedule 21**), his damages for this category would be between **\$32.50** and **\$36.30** total (see **Schedule 1**).³¹ This same formula could be applied to the Class.

37. Once the Class members discover actual identity theft attributable to the Data Breach, a considerable amount of time and resources will be required to deal with the aftermath of that identity theft. According to the 2017 Norton Report on Cyber Security, global losses of victims of cybercrime in 2017 were \$172 billion, or \$142 per victim.³² Of the 978 million people affected by cybercrime in 2017, 34% encountered unauthorized access of a social media account. In the U.S., losses were \$19.4 billion and affected 143.7 million victims, or \$135 per victim. In addition to the monetary losses, the average victim required 24 hours of time, per person, to deal with the identity theft.³³ This time can be valued in the same manner as discussed above—by applying the equivalent hourly

³⁰ May 2017 National Industry Specific Occupational Employment and Wages Estimate: NAICS 812900 – Other Personal Services, Bureau of Labor Statistics.
https://www.bls.gov/oes/2017/may/naics4_812900.htm.

³¹ \$2.6 billion equal to 29 Class members x 5 hours x \$18.06 per hour. \$2.6 billion equal to 29 Class members x 5 hours x \$20.17 per hour.

³² 2017 Norton Cyber Security Insights Report.
<https://www.symantec.com/content/dam/symantec/docs/about/2017-ncsir-global-results-en.pdf>.

³³ Ibid.

rate that would be required to hire a specialist to perform that task, which was between \$18-\$20 per hour.

38. At an average time expenditure of 24 hours per incident, the value of the time needed to address the identity theft would range between **\$433** and **\$484** per incident (see **Schedule 2**).

B. Increased Risk of Identity Theft

39. As a result of the Data Breach, the risk of identity theft has increased for the Class. These individuals will, for the foreseeable future, have to worry about the exposure of their PII. The stress of a possible identity theft will be a constant worry and will likely require the future expenditure of time and resources. One way for the Class members to alleviate or mitigate this risk and stress is to procure credit monitoring services that have insurance clauses to help offset future losses.

40. Currently, there are third-party credit-monitoring services that perform identity monitoring, identity recovery services and provide identity theft insurance.³⁴ Examples include:

Table 3

Vendors Providing Identity Monitoring and Identity Theft Insurance

Lifelock	IDShield	Symantec	Intelius
FireEye	IdentityForce	Proofpoint	IdentityProtect
idwatchdog	Experian	myFICO	PrivacyGuard
IdentityGuard	Fortinet	McAfee	CrowdStrike

41. Notably, many of these services provide insurance or reimbursement (as much as \$1,000,000) against future potential losses.³⁵ In fact, obtaining credit monitoring services has been recommended for data breach victims to help alleviate these concerns.³⁶

42. Because the Class will need this coverage for the foreseeable future and a temporary period of coverage would not suffice, it is reasonable to assume that the Class will need coverage over the entire future period during which their PII will continue to be exposed. Annual subscriptions for credit-monitoring plans range from \$219 and \$330 per year. The service provided by ID Watchdog

³⁴ Identity Theft Protection Services, Federal Trade Commission: Consumer Information.
<https://www.consumer.ftc.gov/articles/0235-identity-theft-protection-services>.

³⁵ <https://www.lifelock.com/>.

³⁶ Do you Need Identity Theft Protection Services?, Sean Pyles, Nerdwallet, February 4, 2019.
<https://www.nerdwallet.com/blog/finance/comparing-identity-theft-protection-services/>.

Platinum (\$219 per year) is described as a basic, no-frills credit monitoring that provides assistance for existing data-breach victims, such as the Class members.³⁷

43. To calculate the value required to alleviate the stress of the Data Breach victims, one would perform the following calculations: First, determine the appropriate value of the subscription and insurance (between \$219 and \$330 per year). Second, determine the appropriate time period for which the Data Breach victims will require coverage. Potentially, the value of hacked information decreases over time; however, once the PII is exposed, it is available to malicious actors indefinitely. Third, discount the future amounts back to present values to determine the current value of increased risk and stress caused by the Data Breach. A risk-free rate of return ought to be used because of the high likelihood of future costs, stress, and risk associated with the Data Breach. For example, the 5-Year Treasury rate of 2.94% as of September 28, 2018 would be appropriate for a calculation involving a similar time period.³⁸

44. I am aware of other experts that have concluded the appropriate time frame of increased risk for data breach victims is at least 5 years.³⁹ Using an estimate of 5 years, the present value of the Class' increased risk and stress would be between **\$1,005** (using a subscription rate of \$219) and **\$1,513** (using a subscription rate of \$330) per Class member (see **Schedule 3**).⁴⁰ Note that this amount is in addition to the time value spent on the consequences of the Data Breach.

VII. PII-Based Damages

45. PII, such as that maintained by Facebook, derives value from remaining private. The value of this privacy should be exclusively enjoyed by Facebook's users. However, as a result of the Data Breach, Facebook essentially granted access to PII for free and conveyed value to unauthorized third parties without compensation to the rightful owners of that information—its users. When the users provided their PII to Facebook, they received the value of Facebook's social media services in return. When Facebook allowed third parties to access the users' PII, no value was conveyed to the users. The value that Facebook's users lost as a result of that conveyance can be measured

³⁷ Do you Need Identity Theft Protection Services?, Sean Pyles, Nerdwallet, February 4, 2019, <https://www.nerdwallet.com/blog/finance/comparing-identity-theft-protection-services/>

³⁸ <https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yieldYear&year=2018>.

³⁹ Declaration of James Van Dyke, August 29, 2019.

⁴⁰ Calculated as 5 annual payments of \$219 or \$330 and discounted back at the appropriate discount rate.

through the Market Method (a standard valuation method) by analyzing what third parties pay to access comparable information.

46. This approach is similar to a patent owner who has been damaged through the unauthorized use of their patented technology. A common and acceptable approach to measuring patent infringement damages is through a reasonable royalty.⁴¹ Comparable royalty rates are typically used to assess reasonable royalty damages, which is a similar market-based method of assessing damages. Thus, the Class' damages can be calculated by determining appropriate rates to compensate the PII owners for the access granted to third parties through Facebook's negligence. Because of the differences in the PII exposed for Group 1 and Group 2, I performed separate damages calculations for each group.

A. Measuring the Appropriate Rates to Compensate the Class for the Access Facebook Granted to PII

47. There are at least two ways to calculate appropriate rates to compensate the Class for the transfer of value enabled by the Data Breach. The first is to look at the values demanded by the PII owners. The second is to look at transactions involving the sale of access to similar PII.

1. Measuring access rates for PII from the perspective of the PII owners

48. From the PII owner's perspective, an individual's entire portfolio of PII has been valued as high as \$1,200 per person.⁴² Figure 4 illustrates how PII owners value various components of PII - many of which are collected and maintained by Facebook, and used to attract advertisers.⁴³

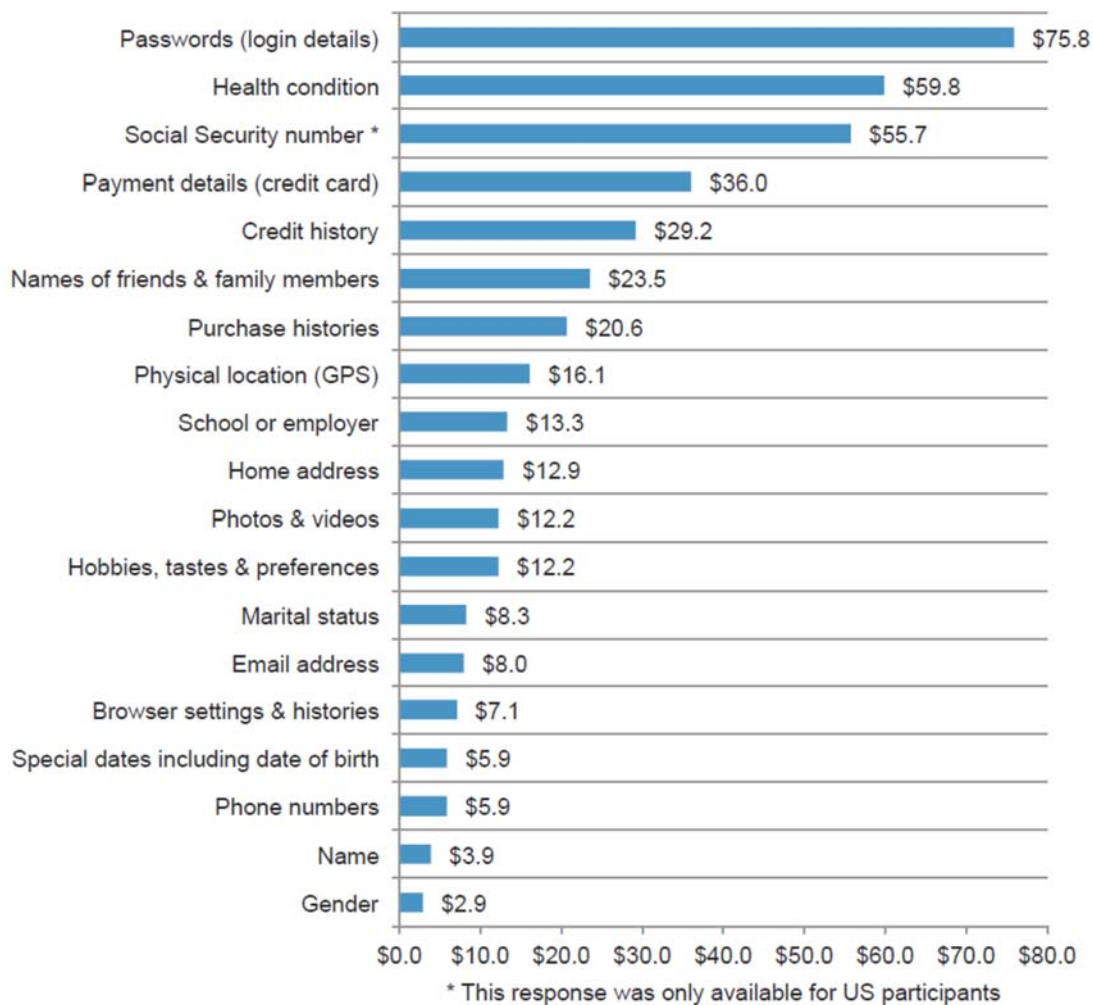
⁴¹ United States Code, Title 35 - PATENTS. § 284 – Damages.

⁴² Migliano, Simon, *Dark Web Market Price Index (US Edition)*, February 27, 2018.
<https://www.top10vpn.com/privacy-central/privacy/dark-web-market-price-index-feb-2018-us/>.

⁴³ Identity Theft and the Value of Your Personal Data, April 30, 2015.
<https://www.trendmicro.com/vinfo/us/security/news/online-privacy/identity-theft-and-the-value-of-your-personal-data>.

Figure 4⁴⁴

Summary of PII Component Survey Values per Ponemon



49. For Group 1, PII owners would demand \$13.90 for just their email address and phone numbers. For the profile information exposed with Group 2, the PII owners would demand \$107.80. (see **Schedule 15**). These values demonstrate that a valuable commodity that should have remained private and only used at the discretion of the Class, is now available to others for free. Facebook's users have been damaged as a result of the value conveyed to third parties by Facebook without compensating its users' for the access granted to their PII. However, these are values according to the PII owners and do not represent actual market-based transactions and, therefore, further analysis is warranted.

⁴⁴ Privacy and Security in a Connected Life: A Study of US, European and Japanese Consumers, Ponemon Institute, LLC, March 2015. https://www.trendmicro.de/cloud-content/us/pdfs/security-intelligence/reports/rt_privacy_and_security_in_a_connected_life.pdf.

2. *Measuring access rates for PII through transactions on the “Dark Web”*

50. There are active markets for PII data similar to the data exposed in the Data Breach. The type of profile data exposed in the Data Breach (see Table 1 above), would be available to third parties with a user’s login credentials. Both individual components of PII are offered for sale as well as bundled information. Stolen login credentials are also available from multiple Dark-Web marketplaces such as “Dream,” “Empire,” and “Wall Street.”⁴⁵ A market exists for stolen PII because malicious actors are able to monetize that information by harvesting the valuable information contained in the users’ profiles. These prices represent the amounts third parties have demanded for access to similar PII. Values for PII on the Dark Web vary greatly depending on the information offered for sale, the quality and quantity of the information, and the perceived value of the data (e.g., access to a Paypal account with a large balance, or Fullz information for a high-credit-score individual will command a premium when compared to generic Fullz information). Given that third parties have bought and sold access to the very PII exposed in the Data Breach demonstrates that this PII indeed has value—otherwise, third parties would not be willing to pay for such access to social media login credentials.

51. It should be noted that these transactions understate the value of PII because the sales do not involve the rightful owner of the PII. Rather, the transactions are for illegally obtained PII and thus do not represent arm’s length transactions between willing sellers and willing buyers that expect to be able to use the information in a legitimate manner. From the perspective of the PII owner, the value of their PII is likely much higher than the prices indicated in Dark Web transactions as demonstrated by Figure 4 above. In my opinion, Dark Web values would be the most conservative estimate for the PII access rates to compensate the Class for Facebook’s exposure of this PII.

52. I have made two separate calculations for the Class due to the differences in the extent of PII exposed in the Data Breach for Group 1 and Group 2. For Group 1, limited PII, including name, email address, and phone numbers were exposed, which is akin to partial Fullz information (Fullz is the term for complete proof of identity information that typically includes name, address, date of birth and a social security number).⁴⁶ For Group 2, more extensive PII information was exposed that includes detailed profile information.

⁴⁵ Migliano, Simon, *Dark Web Market Price Index (US Edition)*, February 27, 2018.
<https://www.top10vpn.com/privacy-central/privacy/dark-web-market-price-index-feb-2018-us/>.

⁴⁶ Rowley, Olivia, Analysis: Pricing of Goods and Services on the Deep and Dark Web, Flashpoint.

B. PII-Based Damages for Group 1

53. For Group 1 Class members whose exposed PII included only email addresses and phone numbers, we analyzed Dark Web transaction data for individual Fullz components, such as date of birth, social security number, name and address. According to the data security company, LifeLock, these individual lines of data sell for as little as \$1.00 each.⁴⁷ This is consistent with my analysis of Dark Web transactions involving partial Fullz information.

54. Based on the data we reviewed, there are numerous transactions involving certain Fullz components. However, most of those transactions involve a social security number, which is not at issue with the Class. Therefore, I compared Dark Web transactions that included only social security numbers and calculated the incremental value of the additional Fullz components. The average rates for social security numbers only is approximately \$2.00 (median) to \$2.06 (average) (see **Schedule 17**). This compares to average rates for social security numbers bundled with other limited PII information such as a name or address, which are between \$3.00 (median) to \$4.41 (average) (see **Schedule 17**). Thus, the incremental value of individual PII components is between \$1.00 to \$2.35. In my opinion, this is a reasonable proxy for the value for accessing individual PII components such as email addresses and phone numbers. Applying this range to Group 1 results in \$15.0 million to \$35.3 million in damages (see Table 4 and **Schedule 4**).

Table 4
Summary of PII-Based Group 1 Damages
(Damages and Members in millions)

	Low Range	High Range
PII Access Rate	\$1.0	\$2.4
Class Members	15.0	15.0
Group 1 PII-Based Damages	\$15.0	\$35.3

55. It should be noted that these values understate the value placed on email addresses and phone numbers by the owners of that data. According to the Ponemon study, PII owners place an \$8 value on their email address and a value of \$5.90 on their phone numbers.⁴⁸

⁴⁷ <https://www.lifelock.org/value-personal-info-much-identity-worth/>. Accessed July 24, 2019.

⁴⁸ Privacy and Security in a Connected Life: A Study of US, European and Japanese Consumers, Ponemon Institute, LLC, March 2015. https://www.trendmicro.de/cloud-content/us/pdfs/security-intelligence/reports/rt_privacy_and_security_in_a_connected_life.pdf.

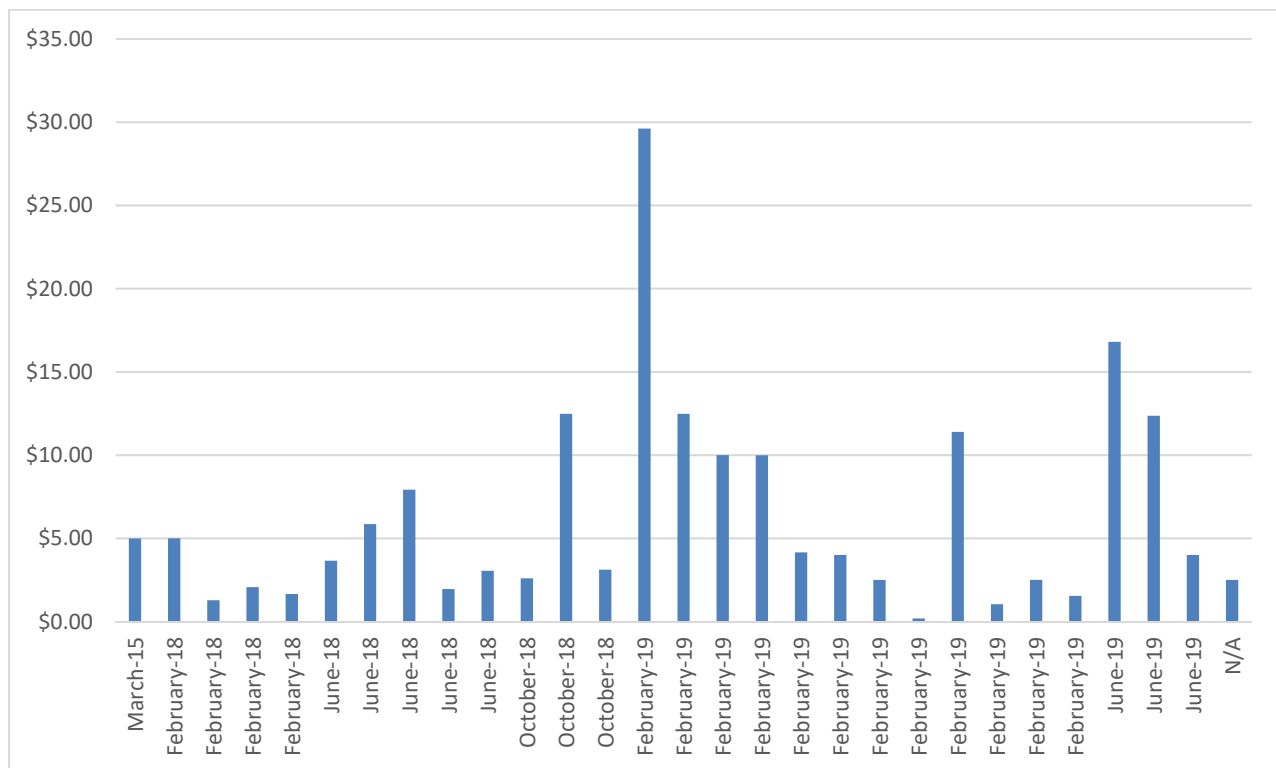
C. PII-Based Damages for Group 2

56. The PII exposed for Group 2 included a significant amount of profile information when compared to Group 1. Therefore, the Dark Web prices for individual Fullz components, as addressed in Section VII.B above, would not sufficiently compensate Group 2 Class members for the PII exposed by Facebook. A more comparable set of Dark Web transactions would be login access to social media accounts, which in theory, would provide access to similar profile-based information. As discussed above, this type of social-media login information is frequently offered for sale on Dark Web marketplaces.

57. Based on our analysis, this type of access is offered for sale on the Dark Web for between \$0.19 and \$29.61, as shown in the Figure 5 below (see **Schedule 16**):

Figure 5⁴⁹

Observed Dark Web Transaction Values for Access to Social-Media Data



58. For the Dark Web values shown in Figure 5 above, the average value is \$6.23 and the median value is \$4.00. Based on these transaction values, it is reasonable to conclude that

⁴⁹ These transactions represent both offers for access to individual Facebook accounts and ranges of values observed by various data security sources.

Facebook's exposure of the PII for Group 2 effectively transferred approximately **\$4.00** to **\$6.23** in value per user to third parties without compensating the owners of that data. Applying these rates to this portion of the Class (14 million) results in damages between \$56.0 million and \$87.2 million (see Table 5).

Table 5⁵⁰
Summary of PII-Based Group 2 Damages
(Damages and Members in millions)

	Low Range	High Range
PII Access Rate	\$4.0	\$6.2
Class Members	14.0	14.0
Group 2 PII-Based Damages	\$56.0	\$87.2

59. Again, due to the nature of the Dark Web transactions, these are not legitimate third-party transactions and the price demanded from the actual account owner would likely be much higher, as indicated in Figure 4 above. As further evidence of this understatement, hackers charge up to \$129 to hack an individual Facebook account.⁵¹

⁵⁰ Schedule 4.

⁵¹ Underground Hacker Marketplace, Annual Report, April 2016, SecureWorks.

VIII. Conclusions

60. The following table summarizes each of the categories of damages I have calculated:

Table 6
Summary Damages Conclusions

Category		Class	Class Members	Low Range	High Range
Time and Risk Based Damages:					
1	Time Spent Dealing with the Data Breach ⁵²	Entire	Mr. Adkins	\$32.50	\$36.30
2	Increased Risk from the Data Breach ⁵³	Each Member	1	1,005	1,513
Value of PII Transferred as a result of the Data Breach: ⁵⁴					
3	Group 1	Entire	15,000,000	\$15,000,000	\$35,254,667
4	Group 2	Entire	14,000,000	\$56,000,000	\$87,234,012

61. I declare under penalty of perjury that the facts set out in this declaration are true to the best of my knowledge.



Ian Ratner, CPA/ABV, ASA, CFE

August 29, 2019
Date

⁵² Schedule 1.

⁵³ Schedule 3p.

⁵⁴ Schedule 4.



CURRICULUM VITAE

Ian Ratner

CPA CA ASA ABV CBV CFE

SUMMARY

Mr. Ratner has approximately 30 years' experience in public accounting, forensic accounting, damage calculations, business valuation services, transaction advisory services, due diligence and bankruptcy consulting.

RELEVANT EXPERIENCE

GlassRatner Advisory & Capital Group LLC

2001 - present

Principal

Atlanta, Georgia

GlassRatner is a financial advisory services firm that specializes in troubled company and bankruptcy consulting, forensic accounting / litigation support and mergers and acquisition advisory services.

KROLL (formerly Lindquist Avey Macdonald Baskerville)¹

1995-2000

Principal

Atlanta, Georgia

Kroll is the world's largest risk mitigation consulting firm. Mr. Ratner was a Principal in the firm's financial services division that specializes in providing fraud investigation, business valuation, litigation support and due diligence services.

ERNST & Young, LLP, 1990 - 1995

Manager – Dispute Resolution and Litigation Services

Atlanta, Georgia, 1993 – 1995,

Manager – Forensic and Litigation Accounting Group

Toronto, Ontario, 1990 – 1993

¹ From November 2000 through July 2001 Ian was the CFO and acting COO of TIC Enterprises, a \$90 million dollar a year sales outsourcing company that specialized in the telecommunications industry. The company was sold in mid-2001.

Manager in two Ernst & Young practice groups that provided forensic and litigation accounting services to attorneys, corporations and government entities. Routinely managed and worked on numerous cases concurrently. Responsible for the development of training material and supervision of new staff to these groups.

RICHTER USHER & VINEBERG, * 1987 - 1990

Chartered Accountants* part time in 1987

Senior Accountant

Montreal, Quebec

Assisted in the performance of audits, reviews and compilations of financial statements for large privately held companies and small publicly traded firms. Also provided tax and accounting assistance to these clients.

CERTIFICATIONS

- Fellow of the American College of Bankruptcy – 2010
- Accredited Senior Appraiser (ASA) – American Society of Appraisers, Business Valuation Section – 1997
- Certified Public Accountant (CPA) – Georgia/South Carolina – 1998/1996
- Accredited in Business Valuation (ABV) from the AICPA
- Accredited Member (AM) – American Society of Appraisers, Business Valuation Section – 1994
- Certified Fraud Examiner (CFE) – 1994
- Chartered Business Valuator (CBV) – Canada – 1992
- Chartered Accountant (CA) – Ontario, Canada – 1990

EDUCATION

- McGill University, Montreal Quebec
Graduate Diploma in Public Accounting
- McGill University, Montreal Quebec
Bachelor of Commerce

MEMBERSHIPS

- Georgia Society of CPAs
- South Carolina Society of CPAs
- American Institute of Certified Public Accountants (AICPA)
- American Society of Appraisers
- Association of Certified Fraud Examiners
- Canadian Institute of Chartered Business Valuators
- Canadian Institute of Chartered Accountants
- Ontario Institute of Chartered Accountants



Ian Ratner

CPA CA ASA CBV ABV CFE

Testimony Experience and Fiduciary Appointments

- | | |
|--|-----------------------|
| 1. Testimony | Page: 2 to 18 |
| 2. Testimony – Tobacco Litigation | Page: 19 to 21 |
| 3. Fiduciary Appointments | Page: 22 to 23 |

Ian Ratner
CPA CA ASA CBV ABV CFE
Testimony Experience & Fiduciary Assignments



Testimony Experience

Robert Blobner v. R.T.G. Furniture Corp.
United States District Court for the Middle District of Florida, Tampa Division
Case No.: 8:17-CV-1676-JSM-SPF
Evidence given by deposition
April 2019
Retained by: **R.T.G. Furniture Corp.**
Counsel: Frank M. Lowrey IV – Bondurant Mixson & Elmore, LLP

Insight Global, LLC v. John Barker and Beacon Hill Staffing Group, LLC
United States District Court for the Northern District of California
Case No.: 3:17-CV-00309 and 5:16-CV-07186-BLF
Evidence given by deposition
January 2019
Retained by: **Insight Global, LLC**
Counsel: Chris Marquardt – Alston & Bird, LLP
David Lowance, Jr. – Insight Global General Counsel
Ariel Zion – Insight Global Deputy General Counsel

Suzhou Allpro Certified Public Accountants Co., Ltd., as Bankruptcy Administrator of Sure Heat Manufacturing (Suzhou) Co. Ltd., v. Sure Heat Manufacturing, Inc., Michael R. Mulberry, Michael S. Mulberry, Harry Clifford Villers, and SHM International Corporation
Case No.: 1: 15-cv-03436-RWS
Evidence given by deposition
September 2018
Retained by: **Suzhou Allpro Certified Public Accountants Co., Ltd.,**
Counsel: Thaddeus D. Wilson – King & Spalding LLP

In Re: Yahoo! Customer Data Security Breach Litigation
United States District Court for the Northern District of California – San Jose District
Case No.: 16-MD-02752-LHK
Evidence given by deposition
August 2018
Retained by: **Proposed Plaintiff Class**
Counsel: John A. Yanchunis – Morgan & Morgan Complex Litigation Group
Gayle M. Blatt – Casey Gerry Schenk Francavilla Blatt & Penfield LLP
Stuart A. Davidson – Robbins Geller Rudman & Dowd LLP

Insight Global, LLC v. Daniel Wenzel, Luke Norman, Lauren Sutmar, and Beacon Hill Staffing Group, LLC
United States District Court for the Southern District of New York
Civil Action No.: 1:17-cv-8323
Evidence given by deposition
August 2018
Retained by: **Insight Global, LLC**
Counsel: David Lowance, Jr. – Insight Global General Counsel
Ariel Zion – Insight Global Associate General Counsel

South Carolina Electric & Gas Company (Sceana) v. Swain E. Whitfield, in his official capacity as Chairman of the South Carolina Public Service Commission; et al
United States District Court for the District of South Carolina, Columbia Division
Case No: 3:18-CV-01795-JMC
Evidence given at trial
July 2018
Retained by: **SCE&G (Sceana)**
Counsel: David Balser – King & Spalding LLP
Jon Chally – King & Spalding LLP

Ian Ratner
CPA CA ASA CBV ABV CFE
Testimony Experience & Fiduciary Assignments



Cabot East Broward 2 LLC, and Cabot East Broward 34 LLC, et al. v. CBRE, Inc., et al.

Case No: 16-CV-61218-WPD

Evidence given by deposition and at trial

June 2018

Retained by: **CBRE, Inc.**

Counsel: Thomas J. Meeks – Carlton Fields Jordon Burt, P.A.
Hardy Roberts – Carey, O'Malley, Whitaker, Mueller, Roberts & Smith, P.A.
Christopher Torres & David B. Weinstein – Greenberg Traurig, P.A.

Tradeline Enterprises Pvt. Ltd. v. Jess Smith & Sons Cotton, LLC, J.G. Boswell Company, and Supima

International Centre for Dispute Resolution and American Arbitration Association

Case No: 01-16-0003-8669

Evidence given at arbitration hearing

February 2018

Retained by: **Supima**

Counsel: Charles Hauff, Jr., / Chris Colyer - Snell & Wilmer L.L.P.

Southern Independent Bank v. Fred's Inc.

United States District Court for the Middle District of Alabama

Civil Action No: 2:15-cv-00799-MHT-WC

Evidence given by deposition

January 2018

Retained by: **Southern Independent Bank**

Counsel: Kenneth Grunfeld – Golomb & Honik, P.C.
Jay Aughtman – Aughtman Law Firm, LLC

Deborah Blase v. Kevin Blase

Superior Court of Fulton County, State of Georgia, Family Court Division

Civil Action File No. 2016-CV-275981

Evidence given by deposition

January 2018

Retained by: **Deborah Blase**

Counsel: Nancy Lawler and David Green – Lawler Green Prinz
Letitia McDonald, Emily Newton, and Lohr Beck-Kemp – King & Spalding

In re: Le Centre on Fourth, LLC

United States Bankruptcy Court, Southern District of Florida, Fort Lauderdale Division

Case No. 17-23632-RBR

Evidence given by deposition and at trial

December 2017

Retained by: **Berger Singerman**

Counsel: Jordi Guso – Berger Singerman
Paul Singerman – Berger Singerman

Vision Construction Ent., Inc. v. Argos Ready Mix, LLC

United States District Court, Northern District of Florida, Gainesville Division

Case No. 3:15-cv-00534MW-CJK

Evidence given by deposition and hearing

November 2017 and August 2018

Retained by: **Argos Ready Mix, LLC**

Counsel: James Bogan – Kilpatrick Townsend & Stockton, LLP
Allen Garrett – Kilpatrick Townsend & Stockton, LLP

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Testimony Experience & Fiduciary Assignments



Team Express Distributing LLC v. Junction Solutions, Inc., Microsoft Corp., and RSM US LLP
United States District Court, Western District of Texas, San Antonio Division

Case No. 5:15-CV-00994-DAE

Evidence given by deposition

October 2017

Retained by: **RSM USA LLP and Junction Solutions, Inc.**

Counsel: Chris Kearney – Kecker, Van Nest & Peters LLP
Jason Kunze – Nixon Peabody LLP

Calesa Associates, LP et al. v. American Capital, Ltd et al. (Re: Halt Medical)

In the Court of Chancery at the State of Delaware

Case No. 10557-VCG

Evidence given by deposition

October 2017

Retained by: **Calesa Associates, LP et al.**

Counsel: Thomas Biemer – Dilworth Paxson LLP

Super98, LLC v. Delta Air Lines,, Inc.

United States District Court, Northern District of Georgia, Atlanta Division

Case No. 1:16-cv-1535-LMM

Evidence given by deposition

August 2017

Retained by: **Delta Airlines, Inc.**

Counsel: David Balser – King & Spalding LLP

SFC Litigation Trust v. Allen Tak Yuen Chan

Superior Court of Justice, Ontario

Case No. CV-14-10684-00CL

Evidence given at trial

April 2017

Retained by: **Chan**

Counsel: Robert Rueter – Rueters, LLP

In re: SNMP Research, Inc., et al. v. Nortel Networks Inc., et al.

United States Bankruptcy Court, District of Delaware

Chapter 11 Case No. 09-10138 (KG) Jointly Administered, Adv. Proc. No. 11-53454 (KG)

Evidence given by deposition

February 2017

Retained by: **SNMP Research, Inc.**

Counsel: Nicholas J. Brannick – Cole Sholtz P.C.
G. David Dean – Cole Sholtz P.C.
Richard S. Busch – King & Ballow Law Offices
John L. Wood – Egerton, McAfee, Armistead & Davis P.C.

Caradigm USA LLC v. Pruitthealth, Inc. f/k/a UHS-Pruitt Corp.

United States District Court, Northern District of Georgia, Atlanta Division

Case No. 1:15-CV-02504

Evidence given by deposition and at trial

November 2016 and July 2018

Retained by: **Caradigm USA LLC**

Counsel: Chris Giovino – Bondurant, Mixson & Elmore LLP

PFT Technology LLC v. Robert Weiser v. Patrick Keelan, Thomas Smith, and Frank Castellano

Supreme Court of the State of New York, County of Nassau

Case No. 8679-12

Evidence given at trial

September 2016

Retained by: **PFT Technology and Patrick Keelan, Thomas Smith and Frank Castellano**

Counsel: William Wallach – McCarter & English LLP

Ian Ratner
CPA CA ASA CBV ABV CFE
Testimony Experience & Fiduciary Assignments



In re: AstroTurf, LLC
U.S. Bankruptcy Court, Northern District of Georgia
Case No. 16-41504
Evidence given by deposition and at trial
August 2016

Retained by: **Official Committee of General Unsecured Creditors**
Counsel: Frank DeBorde – Morris, Manning & Martin LLP
Lisa Wolgast – Morris, Manning & Martin LLP

Bahamas Sales Associate, LLC v. Donald Cameron Byers and associated counterclaim in Ginn
Sur Mer Consolidated Lot Owner Litigation
United States District Court, Middle District of Florida, Jacksonville Division
Case No. 3:08-cv-1012-J-32JRK
Evidence given by deposition
July 2016

Retained by: **Edward R. Ginn, II; ERG Enterprises, LP; Ginn Financial Services; Bahama Sales Associate, LLC; Dean S. Adler and Lubert-Adler Management Company, LP**
Counsel: Robert P. Alpert – Morris, Manning & Martin LLP
Stephen J. Kastenbergs – Ballard Spahr LLP

In re: HELLAS TELECOMMUNICATIONS (LUXEMBOURG) II SCA,
Debtor in a Foreign Proceeding.
United States Bankruptcy Court Southern District of New York
Chapter 15 Case No. 12-10631 (MG), Adversary Proceeding No. 14-01848
(MG) Evidence given by deposition
June 2016

Retained by: **Andrew Lawrence Hosking and Bruce Mackay in their capacity as joint compulsory liquidators**
Counsel: Andrew Rosenblatt, Esq.
Howard Seife, Esq. Marc D. Ashley, Esq.
Chadbourne & Parke LLP

Owl's Eyes of Asheville, LLC, Owl's Eyes of Kitty Hawk, LLC, Owl's Eyes of Ocala, LLC, and Owl's Eyes of Gainesville, LLC v. Hooters of America, LLC
Superior Court of Cobb County, State of Georgia
Case No. 11-1-8857-99
Evidence given by deposition
March 2016

Retained by: **Owl's Eyes of Asheville, LLC, Owl's Eyes of Kitty Hawk, LLC, Owl's Eyes of Ocala, LLC, and Owl's Eyes of Gainesville, LLC**
Counsel: Jason S. Alloy, Esq.
Robbins Ross Alloy Belinfante Littlefield LLC

Charlotte Burnett, et al, v. The Fulton County Board of Trustees, et al. Superior Court of Fulton County, State of Georgia
Case No. 2010-CV-194160
Evidence given by deposition
November 2015

Retained by: **The Fulton County Board of Trustees**
Counsel: Michael Kramer, Esq.
Buckley Beal, LLP

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Testimony Experience & Fiduciary Assignments



Predictix, LLC v. Emre Sener
Superior Court of Fulton County, Business Case
Division Case No.2015-CV-259646
Evidence given at trial and by deposition
November 2015 and October 2015
Retained by: **Predictix, LLC**
Counsel: James A. Washburn, Esq. - Troutman Sanders LLP

Melanie E. Damian, as Receiver for the Estate of Aubrey Lee Price, et al, v. Nelson Mullins Riley & Scarborough, L.L.P., et al
United States District Court, Northern District of Georgia, Atlanta
Division Case No. 2014-CV-03498-TCB
Evidence given by deposition
July 2015 and September 2015
Retained by: **Nelson Mullins Riley & Scarborough, L.L.P., et al**
Counsel: David Balser, Esq. Lawrence Slovensky, Esq. - King & Spalding LLP

James D. Hinson Electrical Contracting Co., Inc.; Blythe Development Company and Callaway Grading, Inc., individually and on behalf of all others similarly situated; and National Utility Contractors Association. v. AT&T Services, Inc. and BellSouth Telecommunications, LLC
United States District Court, Middle District of Florida
Case No. 3:13-CV-29-J-32JRK
Evidence by deposition
April 2015
Retained by: **AT&T Services, Inc., et al.**
Counsel: James F. Bogan III, Esq., John P. Jett, Esq. and Cindy D. Hanson, Esq.
Kilpatrick Townsend & Stockton LLP (Georgia)

In re: Oil Spill by the Oil Rig "Deepwater Horizon" in the Gulf of Mexico, on April 20, 2010 United States District Court, Eastern District of Louisiana
MDL No. 2179, Section J
Evidence given at trial and by depositions (2)
January 2015 and October 2014
Retained by: **U.S. Department of Justice - Environment & Natural Resources Division**
Counsel: Patrick Casey, Esq. – U.S. Department of Justice
Nancy Flickinger, Esq. – U.S. Department of Justice

Jay Raja, M.D. v. Englewood Community Hospital, Inc.
United States District Court, Middle District of Florida, Tampa
Division Case No. 8:12-CV-02083-T-36AEP
Evidence by deposition
August 2014
Retained by: **Englewood Community Hospital, Inc.**
Counsel: Martin B. Goldberg, Esq. – Lash & Goldberg LLP
C.J. Gideon, Jr., Esq. – Gideon, Cooper & Essary, PLC

RL Partners I. LLC d/b/a R.L. Partners, LLC v. Angel Oak Capital Advisors, LLC, Brad Friedlander, and John Does 1-5
State Court of DeKalb County, State of Georgia
Case No. 12-A-45380-7
Evidence by deposition
May 2014
Retained by: **R.L. Partners, LLC**
Counsel: John M. Gross, Esq. – Taylor English Duma, LLP

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CPA CA ASA CBV ABV CFE
Testimony Experience & Fiduciary Assignments



MPEG LA, L.L.C. v. Dell Global B.W. and Dell Products, L.P. and Dell Global B.V. and Dell Products, L.P. v. MPEG LA, L.L.C. (Counterclaim) Court of Chancery of the State of Delaware
Case No. 7016-VCP
Evidence by deposition
February 2014

Retained by: **Dell Global B.V. and Dell Products, L.P.**
Counsel: Michael P. Kenny, Esq. and Angela P. James, Esq.
Alston & Bird, LLP

Jonathon Marc Seidel, as Executor of the Estate of Nancy Noblin v. Dana Marie David LaChance, as Executor of the Estate of Edgar George David and Dana Marie David LaChance as General Partner of EDG Properties, LP
JAMS Reference No. 1440003820
Evidence at Arbitration
February 2014

Retained by: **Jonathon Marc Seidel, as Executor of the Estate of Nancy Noblin**
Counsel: David N. Dreyer, Esq.
Chamberlain Hrdlicka White Williams & Autry

Federal Trade Commission v. Hold Billing Services, et. al.
United States District Court, Western District of Texas, San Antonio Division
Case No. SA-98-CA-0629-FB
Evidence at trial
November 2013

Retained by: **BSG Group**
Counsel: Dina M. Cox, Esq.
Lewis Wagner, LLP

Atlantic Southeast Airlines, Inc. and SkyWest Airlines, Inc. v. Delta Airlines, Inc. Superior Court of Fulton County, State of Georgia
Civil Action File No.: 2008-CV-145995
Evidence by deposition
June 2013, May 2013, and November 2013

Retained by: **Delta Airlines, Inc.**
Counsel: Cathy O'Neil and David Meadows - King & Spalding

Crider, Inc. v. Eugene Welka and Huntsman Gay Global Capital, LLC Superior Court of Chatham County, State of Georgia
Civil Action No.: CV11-1134-AB
Evidence by deposition
July 2013 and October 2013

Retained by: **Crider, Inc.**
Counsel: John P. Hutchins and Christopher A. Wiech Troutman Sanders, LLP

EarthCam, Inc. v. OxBlue Corporation, Chandler McCormack, John Paulson, Bryan Mattern and Richard Hermann
United States District Court, Northern District of Georgia, Atlanta Division
Civil Action No.: 1:11cv-02278-WSD
Evidence by deposition
July 2013

Retained by: **OxBlue Corporation**
Counsel: Mathew B. Ames Christopher S. Anulewicz Balch & Bingham LLP

Ian Ratner
CPA CA ASA CBV ABV CFE
Testimony Experience & Fiduciary Assignments



Abraham I. Awwad v. Largo Medical Center, Inc., a Florida corporation d/b/a Largo Medical Center
United States District Court, Middle District of Florida, Tampa Division
Case No.: 8:11-cv-01638-SCB-TBM
Evidence by deposition

May 2013

Retained by: **Largo Medical Center, Inc.**
Counsel: Martin B. Goldberg Lash & Goldberg LLP

Livent, Inc., through its Special Receiver and Manager, Roman Doroniuk v. Deloitte & Touche and
Deloitte & Touche, LLP

Superior Court of Justice, Province of Ontario,
Canada Court File No.: 02-CV-225823 CM2

Evidence given at trial

May 2013

Retained by: **Livent, Inc.**
Counsel: Peter Howard and Patrick O'Kelley
Stikeman Elliott (Ontario, Canada)

The Medical Group of St. Joseph's LLC d/b/a St. Joseph's Medical Group v. Gerald A. Feuer, M.D.
Superior Court of Fulton County, State of Georgia

Civil Action File No.: 2011-CV-208262

Evidence by deposition

March 2013

Retained by: **The Medical Group of St. Joseph's LLC**
Counsel: Craig Bertschi
Kilpatrick Townsend & Stockton, LLP

Seven Seas Petroleum, Inc. v. CIBC World Markets Corp.
United States District Court, Southern District of Texas, Houston

Division Civil Action No. 4:08 CV03048

Evidence given at trial and by deposition

January 2013 (trial); Deposition October 2011

Retained by: **CIBC World Markets, Inc.**
Counsel: James A. Washburn, Esq.
Matt Martin, Esq.
McKenna Long & Aldridge, LLP

Boykin Anchor Company, Inc. v. Larry Wong and AT&T Services, Inc.

U.S District Court, Eastern District of North Carolina, Western

Division Case No. 5:10-CV-0591-FL

Evidence given by deposition

August 2012

Retained by: **AT&T Services, Inc.**
Counsel: John Moye, Esq.
Kilpatrick Townsend LLP

Old TBR, Inc, fka The Billing Resource, dba Integretel v. The Billing Resource, LLC

U.S. Bankruptcy Court, Northern District of California, San Jose

Division Case No. 07-52890 ASW

Evidence given at trial

June 2012

Retained by: **Old TBR, Inc, fka The Billing Resource, dba Integretel (Debtor)**
Counsel: John Fiero, Esq.
Gail Greenwood, Esq.
Pachulski, Stang, Ziehl & Jones LLP

Ian Ratner
CPA CA ASA CBV ABV CFE
Testimony Experience & Fiduciary Assignments



U.S. District Court for the Eastern District of North Carolina, Western
Division Case No. 5:09-CV-00412-FL
Evidence given by deposition and at trial
February 2012 and September 2010
Retained by: **Scenera Research LLC**
Counsel: John Moye, Esq.
Kilpatrick Stockton LLP

Innotex Precision Limited v. Horei Image Products, Inc. and ITM Corporation
U.S. District Court for the Northern District of Georgia, Atlanta
Division Case No. 1:09-CV-0547 (TWT)
Evidence given by deposition and at trial
December 2011 and June 2010
Retained by: **Innotex Precision Limited**
Counsel: Christopher G. Campbell
DLA Piper

nVision Global Technology Solutions, Inc. v. Cardinal Health 5, LLC
United States District Court, Northern District of Georgia, Atlanta
Division Civil Action No. 1:11-CV-00389-WSD
Evidence given by deposition
October 2011
Retained by: **nVision Global Technology Solutions, Inc.**
Counsel: John Sherrill, Esq.
Wayne Bond, Esq.
Seyfarth Shaw, LLC

Georgia Department of Transportation v. Fourteenth Street Venture,
LP; Revco Discount Drug Centers, Inc. (CVS Pharmacy), et al.
Superior Court of Fulton County, Georgia
Case No. 2006-CV-119485
Evidence given at deposition and at trial
March and September 2011
Retained by: **CVS Pharmacy, Inc.**
Counsel: A. J. "Buddy" Welch, Jr., Esq.
William A. White, Esq.
Smith, Welch, Webb & White, LLC

Reynolds Ready Mix, L.L.C. v. Conrad Yelvington Distributors, Inc.
Circuit Court in and for Escambia County, Florida (Civil Division)
Case No. 2007-CA-003015
Evidence given by deposition and at trial
August 2011 and September 2011
Retained by: **Conrad Yelvington Distributors, Inc.**
Counsel: George McArdle, Esq.
McArdle & Perez, P.A.

Lord Corporation v. S&B Technical Products, Inc., Terramix S.A., and Mark A. Weih
U.S. District Court for the Eastern District of North Carolina, Western Division
Case No. 5:09-CV-00205-D
Evidence given by deposition
April 2011 and October 2010
Retained by: **Lord Corporation**
Counsel: Betsy Lanzen, Esq.
Kilpatrick Stockton LLP

Ian Ratner

CPA CA ASA CBV ABV CFE

Testimony Experience & Fiduciary Assignments



Convergent Wealth Advisors, LLC v. William deButts, III, et al.
American Arbitration Association Case No. 51 116 00505 10
Evidence given by report and at arbitration hearing
January 2011

Retained by: **Convergent Wealth Advisors, LLC**
Counsel: Matthew Eisenstein, Esq.
Matthew Keiser, Esq.
Arnold & Porter, LLP

PJ Cannon, et al. v. H&R Block, Inc. et al.
The Superior Court of Fulton County – State of Georgia
Case No 2007CV137010
Evidence given by deposition
April 2010

Retained by: **H&R Block, Inc.**
Counsel: Lee H. Zell, Matthew B. Ames
Balch & Bingham LLP

Advanced Disposal Services, Inc. v Etowah Environmental Group LLC
American Arbitration Association
File No. 30-180-Y-00671-07 and 30-180-Y-00456-09
Evidence given at deposition and arbitration hearing
March 2010

Retained by: **Advanced Disposal Services, Inc.**
Counsel: Joshua Archer
Balch & Bingham LLP

IH Riverdale, LLC and Geoffrey Nolan v. McChesney Capital Partners, LLC, Riverdale Capital Investments, LLC et al.
The Superior Court of Fulton County – State of Georgia
Case No 2003CV73603
Evidence given by deposition
October 2009 and February 2005

Retained by: **IH Riverdale, LLC and Geoffrey Nolan**
Counsel: David Pardue
Adorno & Yoss LLP

Jacqueline T. Hodges, et al. v. MedAssets Net Revenue Systems, LLC
U.S. District Court for the Northern District of Georgia, Atlanta
Division Case No. 1:01-CV-2985 WSD
Evidence given at deposition
February 2008

Retained by: **MedAssets Net Revenue Systems, LLC**
Counsel: Craig Bertschi
Kilpatrick Stockton, LLP

U.S. Bankruptcy Court for the Middle District of Georgia, Macon Division
Case Nos. 08-11096, 08-11097, 08-11098
Evidence given at deposition and in Court
August and November 2008

Retained by: **Stratus Group, Inc. et al.**
Counsel: Paul Ferdinands
King & Spalding LLP

Ian Ratner
CPA CA ASA CBV ABV CFE
Testimony Experience & Fiduciary Assignments



Southern Waste & Recycling, Inc. and Phillip E. Kitchens v. Discount Waste Solutions, Inc.
The US District Court for the Middle District of Florida, Jacksonville Division
Case No. 3:07-CV-00598-TJC-MCR
Evidence given at deposition and arbitration hearing
November 2008
Retained by: **Discount Waste Solutions, Inc.**
Counsel: Matthew B. Ames
Balch & Bingham LLP

James D. Hinson Electrical Contracting Co., Inc., et al. v. BellSouth Telecommunications, Inc.
The US District Court for the Middle District of Florida, Jacksonville Division
Case No. 3:07-CV-00598-TJC-MCR
Evidence given at deposition
October 2008
Retained by: **AT&T, Inc. (successor to BellSouth Corporation)**
Counsel: Albert L. Frevola, Jr.
Adorno & Yoss, LLP

J. Kinson Cook of Georgia, Inc. v. The DeKalb County School District
The Superior Court of DeKalb County, State of Georgia
Case No. 04CV1123-1
Evidence given at deposition
August 2008
Retained by: **DeKalb County School District**
Counsel: Andrew Shore
Phillips & Morgan LLP

University of Kansas and Kansas Athletics, Inc. v. Larry Sinks, Victory Sportswear, LLC and Larry Sinks Enterprises, Inc.
The US District Court for the District of Kansas
Case No. 06-2341 KHV-GLR
Evidence given at Trial
July 2008
Retained by: **University of Kansas and Kansas Athletics, Inc**
Counsel: Charles Henn
Kilpatrick Stockton LLP

C. Alan Bentley, Chapter 11 Trustee v. Ross Mangano, et al.
In Re: Mego Financial Corp., et al.
US Bankruptcy Court, District of Nevada
Case No. BK-N-03-52300-GWZ, Jointly Administered
Evidence given by report and deposition
November 2007
Retained by: **C. Alan Bentley, Chapter 11 Trustee**
Counsel: Steven M. Berman
Berman, PLC

TCR GA Construction LP v Emory University
The State of Georgia, Dekalb County Superior Court
Civil Action File Nos. 03CV6826-7 and 04-7488-7
Evidence given by deposition
November 2007
Retained by: **Emory University**
Counsel: William B. Hughes, Jr.
Alston & Bird, LLP

Ian Ratner
CPA CA ASA CBV ABV CFE
Testimony Experience & Fiduciary Assignments



Skidaway Health and Living Services, Inc. v. Manhattan Construction Company
American Arbitration Association-File No. 30 110 Y 00105 06
Evidence given by report and at arbitration hearing
September 2007
Retained by: **Manhattan Construction Company**
Counsel: John I. Spangler, III
Alston & Bird, LLP

Concord, Inc. v. Medical Arts Properties, LP
The State of Georgia, Hall County Superior Court
Case No. 2006 CV 1904C
Evidence given by deposition
May 2007
Retained by: **Concord, Inc.**
Counsel: Joseph F. Hession, Esq.
Carlton Fields, PA

Healthpoint, Ltd. and DPT Laboratories, Ltd. v. River's Edge Pharmaceuticals, LLC
The US District Court for the District of Texas, San Antonio Division
Case No. SA 03 CA 0984 RF
Evidence given by deposition
April 2007
Retained by: **River's Edge Pharmaceuticals, LLC**
Counsel: Robert Brazier, Esq. Gambrell & Stolz, LLP

Lupton-Smith, et al. v. Atlanta Bread Company International, Inc.
The State of Georgia, Cobb County Superior Court
Case No. 06-1-1404-05
Evidence given by deposition
February 2007
Retained by: **Sean Lupton-Smith, et al.**
Counsel: Randy Edwards, Esq.
Kilpatrick Stockton, LLP

Samuel Kellet and Stiles Kellet et al. v. PricewaterhouseCoopers LLP et al.
The State of Georgia, Cobb County Superior Court
Case No. 02-1-8314-35
Evidence given by Affidavit, deposition, and trial
February 2006, May 2006, and January 2007
Retained by: **Samuel and Stiles Kellet**
Counsel: Michael Bowers, Esq. and Chris Anulewicz, Esq.
Balch & Bingham, LLP

James C. Cook et al. v. Worldwide Insurance Network, Inc.
AAA - Case No. 30-104-Y-01362-05
Evidence given by deposition and at Arbitration Hearing
November and December 2006
Retained by: **Worldwide Insurance Network, Inc.**
Counsel: William Clineburg Jr., Esq.
King & Spalding

Caterpillar, Inc. v. J. Garner Scott et al.
The US District Court for the District of South Carolina Columbia
Division Case No. 3:04-21789-17
Evidence given by deposition
September 2006
Retained by: **J. Garner Scott et al**
Counsel: Richard Farley, Esq.
KMZ Rosenman

Ian Ratner

CPA CA ASA CBV ABV CFE

Testimony Experience & Fiduciary Assignments



WH Smith Airport Services, et al. v. City of Atlanta
The Superior Court of Fulton County
Civil Action File No. 2004CV95357
Evidence given by deposition and at Trial
September 2006 and October 2006
Retained by: **City of Atlanta** Counsel:
Robert Caput
City of Atlanta – Law Department

Beers Construction Company, v. Pikeville United Methodist Hospital of Kentucky, Inc.
The US District Court for the Eastern District of Kentucky Pikeville
Division Case No. 00-454-KKC
Evidence given by deposition
August 2006
Retained by: **Beers Construction Company**
Counsel: Jeffrey Belkin, Esq. and John Spangler III, Esq.
Alston & Bird LLP

NUCO Investments, Inc. v. Hartford Fire Insurance Company
The US District Court for the Northern District of Georgia – Atlanta
Division Case No. 1:02-CV-1622
Evidence given by deposition
June 2006
Retained by: **NUCO Investments**
Counsel: Edmund M. Kneisel Esq.
Kilpatrick Stockton

Landmark Environmental Industries, Inc. v. City of Atlanta
Georgia Court of Appeals
Case No. A04A1836 and 37
Evidence given by deposition
May 2006
Retained by: **City of Atlanta**
Counsel: David Meezan, Esq and Mac Gibson, Esq.
Alston & Bird LLP

Modern Cable Technology, Inc. v. Department of Administrative Services, et al.
The State of Georgia, Fulton County Superior Court
Case No. 2003-CV-74855
Evidence given by deposition
November 2005
Retained by: **Modern Cable Technology, Inc**
Counsel: Gary Patrick, Esq.
Patrick, Beard, Schulman & Jacoway PC

Department of Transportation v. Stockbridge CVS, et al.
Evidence given by deposition and trial
November 2005, January 2008 Retained
by: **CVS Corporation**
Counsel: John Hutchins, Esq.
Troutman Sanders

Ian Ratner
CPA CA ASA CBV ABV CFE
Testimony Experience & Fiduciary Assignments



Accounting Machine Systems, Inc. v. Branch Banking & Trust Company
The State of North Carolina, Wake County Superior Court
Case No. 03 CVS 11803
Evidence given by deposition
October 2005
Retained by: **Branch Banking & Trust Company**
Counsel: Jay Silver, Esq.
Kilpatrick Stockton LLP

Del Monte Fresh Produce N.A. v. Georgia National Produce, LLC et al. The
US District Court for the Northern District of Georgia – Atlanta Division Case
No 1:04-CV-0769
Evidence given by deposition
February 2005
Retained by: **Georgia National Produce, LLC et al.**
Counsel: Thomas Gallo
Robins Kaplan

DryKor Inc. v. FlatPlate Inc.
The Superior Court of Fayette County – State of Georgia
Case No 2003V-0239-C
Evidence given by deposition and at trial
November 2004 and December 2004
Retained by: **DryKor Inc.**
Counsel: David Zacks, Audra Dial
Kilpatrick Stockton

Delta Airlines Inc. v. The Smart Flyer et al,
The US District Court for the Northern District of Georgia – Atlanta Division
Case No 63-CV-2652RWS
Evidence given by report and deposition
November 2004
Retained by: **Delta Airlines Inc.**
Counsel: Frank M. Lowrey IV
Bondurant, Mixson & Elmore, LLP

Atlanta Retail, Inc. f/k/a Wolf Camera v. The Eastman Kodak Company
US Bankruptcy Court For the Northern District of Georgia Atlanta
Division Case Nos. 01-83470, 01-83472, 01-83474, 01-83475
Evidence given by report, deposition
June 2004 and August 2004
Retained by: **The Eastman Kodak Company**
Counsel: Neil Olack, Duanne Morris
Dan Sklar, Nixon Peabody

Iakov Grenader et al v. Gregory Gitman, Grigori Galperine, et al.
The Superior Court of Fulton County – State of Georgia Evidence
given by report, deposition and at trial
June 2004
Retained by: **Dr. I Grenader**
Counsel: David Balser, James Washburn
McKenna Long & Aldridge

Ian Ratner
CPA CA ASA CBV ABV CFE
Testimony Experience & Fiduciary Assignments



Federal Trade Commission ("FTC") v. Cyberspace.Com et. al.
United States District Court Western District of Washington at Seattle
Evidence given by declaration and at trial
December 2003 and January 2004
Retained by: **Cyberspace.Com** Counsel:
Joel Dichter, Jane Jacobs
Klein, Zelman, Rothermel and Dichter

Re: Connecticut Mobilecom, Inc. US Bankruptcy Court Southern District of NY
Adversary Proceeding No. 02-02519
Evidence given by report, deposition and trial
November 2003 and December 2003
Retained by: **Verizon Wireless** Counsel:
Grant Stein, Mark McCarty
Alston& Bird

Southeastern Medical Group Inc., v. CSC Healthcare Inc.(Nichols TXEN Corp.)
Evidence given by report, deposition and arbitration hearing
November 2003 and December 2003
Retained by: **CSC Healthcare Inc.**
Counsel: Chris Christie
Bradley Arant Rose & White

Hope v. AMN Acquisition Corp and Ameron International Corp. Evidence given by report and at arbitration hearing
June 2003
Retained by: **Ameron International Corp.**
Counsel: Craig Bertschi
Kilpatrick Stockton

Equifax Information Services LLC v. Zoot Enterprises, Inc.
Evidence given by deposition and at arbitration hearing
March & April 2003
Retained by: **Equifax Information Services, LLC**
Counsel: Matthew H. Patton
Kilpatrick Stockton

Richard Corey MD v. Roswell Radiology et al.
Evidence given by deposition
January 2003
Retained by: **Dr. Richard Corey**
Counsel: Craig Bertschi
Kilpatrick Stockton

Bridgewater Group, Inc. et al. v. Gates
Evidence given by deposition and at trial
July 2002, December 2002
Retained by: **Mr. M. Gates**
Counsel: Andrew Beal
Mayer & Beal

United States Ex Rel. Brigitte Jacobs, v. PSI, Andrew and Michelle Bryan, Dominion Management Georgia Company
Evidence given by deposition and at Daubert hearing
October 2002, February 2003
Retained by: **Dominium Management Co.**
Counsel: Thomas Gallo
Robins Kaplan

Ian Ratner

CPA CA ASA CBV ABV CFE

Testimony Experience & Fiduciary Assignments



Lowe's Home Centers, Inc. v. General Electric Company
Evidence given by deposition, at Daubert hearing and at trial
July 2000, February 2001, May 2001, February 2002

Retained by: **Lowe's Home Centers, Inc.**

Counsel: Steve Berlin, Susan Cooper, Rick Horder
Kilpatrick Stockton

Southeastern Oncology Associates, v. CSC Healthcare Inc.(Nichols TXEN Corp.)
Evidence given at arbitration hearing
November 2001

Retained by: **CSC Healthcare Inc.**

Counsel: Joel Brown, Chris Christie
Bradley Arant Rose & White

Dr. Marshall Nash v. Georgia Neurology Associates
Evidence given at arbitration hearing
May 2000

Retained by: **Dr. Marshall Nash**

Counsel: Peter Weisz & Associates

Prime Rate Premium Finance Corp., Inc. et al. v. Unisun Insurance Company
Evidence given by deposition
April 2000

Retained by: **Unisun Insurance Co.**

Counsel: Tom Salane
Turner, Padgett, Graham & Laney

Klein v. Klein
Evidence given by testimony at trial
March 2000

Retained by: **Ms. Klein**

Counsel: Michelle Rapoport
Rubin, Winter, Rapoport & Hall

Cat Trax Inc. vs. West Marine Inc.
Evidence given by expert report and deposition
February 2000

Retained by: **West Marine Inc.**

Counsel: John Watkins
Long Aldridge & Norman

Huttig Sash & Door Co. v. Millwork Sales Inc.
Evidence given by expert report and deposition
February 2000

Retained by: **Millwork Sales Inc.**

Counsel: Thom Kilpatrick
Alston & Bird

B&N Companies, Inc. v. Blockbuster Video, Inc.
Evidence given by affidavit and deposition
November 1999

Retained by: **Blockbuster Video**

Counsel: Rebecca Lamberth
Alston & Bird

Ian Ratner
CPA CA ASA CBV ABV CFE
Testimony Experience & Fiduciary Assignments



Dr. Pridemore v. Orthodontic Centers of America
Evidence given by expert report and deposition
January 1999

Retained by: **Dr. Pridemore**
Counsel: Neal Berinhout
Kilpatrick Stockton

CenCel, Inc., MCT Cellular, Inc. and SCC Cellular Telephone Corp. v. Contel Cellular
Evidence given by report, deposition and at trial
September 1998, October 1998, and December 1998

Retained by: **Contel Cellular**
Counsel: Tupper Kinder
Nelson Kinder Mosseeau & Gordon (New Hampshire)

Nordiska Tele8 v. Integretel Inc.
Evidence given at mediation hearing
December 1998

Retained by: **Tele8**
Counsel: K. Diemer
Campeau & Thomas (California)

Highland Pines Nursing Manor, Inc., SMS, et al. v. TheraTx, Inc. et al.
Evidence given by deposition
December 1998

Retained by: **TheraTx, Inc.**
Counsel: Rebecca Simmons
Akin, Gump, Strauss, Hauer & Feld, LLP (Texas)

Multiskins International v. AWC Liquidation Corp.
Evidence given by affidavit, deposition and trial
April, June and July 1998

Retained by: **Multiskins International**
Counsel: Anne Bookout/
Smith, Katzenstein & Furlow, LLP (Delaware)

American Family Brands Inc. v. GEI et al. Evidence
given by expert report and deposition *January and
March 1998*

Retained by: **American Family Brands**
Counsel: Thomas Biemer
Dilworth, Paxson LLP (Pennsylvania)

Curtice v. Bay Area Cellular Telephone Co. and GTE Mobilnet
Evidence given by expert declaration
February 1998

Retained by: **GTE Mobilnet**
Counsel: Peter Kontio, Elise Kirban
Alston & Bird (Georgia)

Shell Oil v. Transdistribution, ABC Building Company, et al.
Evidence given by expert report and deposition
July 1997 and October 1997

Retained by: **ABC Building Company**
Counsel: David Patterson
Keener, Doucher, Curley, Patterson (Ohio) Bob Hill / McLain & Merrit (Georgia)

Ian Ratner
CPA CA ASA CBV ABV CFE
Testimony Experience & Fiduciary Assignments



Tom Cooper v. Kodak et al.
Evidence given by affidavit and deposition
February 1997
Retained by: **Tom Cooper**
Counsel: John Marshall, Marshall Law Group (Georgia)

Stoval Nissan, Inc. v. Nissan Motor Credit Corp.
Evidence given by deposition
January 1997
Retained by: **Stoval Nissan, Inc.**
Counsel: Robert C. Koski
The Koski Firm (Georgia)

BI-LO Inc. v. Ingles Supermarkets
Evidence given by affidavit (two), deposition and trial
June 1996, September 1996 and March 1997
Retained by: **BI-LO Inc.**
Counsel: Harvey Sanders
Leatherwood Walker Todd & Mann (South Carolina)

Southern Loan Co. v. Unisun Insurance Evidence given by deposition and trial July 1996 and August 1997
Retained by: **Unisun Insurance**
Counsel: Thomas Salane
Turner, Padgett, Graham, and Laney (South Carolina)

Georgia. v. Michael H. Chapel
Superior Court of Gwinnett County
Evidence given at trial
Fall 1995
Retained by: **M. H. Chapel Defense Fund**
Counsel: Johnny Moore, Esq. (Georgia)
Turner, Padgett, Graham, and Laney (South Carolina)

Ian Ratner
CPA CA ASA CBV ABV CFE
Testimony Experience & Fiduciary Assignments



Expert Testimony – Tobacco Litigation

Rozar v. R.J. Reynolds Tobacco Company, et al.
Engle Progeny Cases – Tobacco Litigation
Circuit Court of the Eleventh Judicial Circuit, Dade County, Florida (Civil Division)
Case No. 2017-CA-004311
Evidence given by deposition
February 2018
Retained by: **Myra Rozar**
Counsel: Robert Shields, Esq.
Doffermeyre, Shields, Canfield, Knowles & Devine LLC
Nelson Kinder Mosseeau & Gordon (New Hampshire)

Faricy Pardue v. R.J. Reynolds Tobacco Company, et al.
Engle Progeny Cases – Tobacco Litigation
Circuit Court of the Eighth Judicial Circuit, Alachua County, Florida (Civil Division) Case
No. 01-2014-CA-2010
Evidence given by deposition *April*
2016 and November 2016
Evidence given at trial
December 2016
Retained by: **Estate of John H. Faricy**
Counsel: Robert Shields, Esq.
Leslie Bryan, Esq.
Doffermeyre, Shields, Canfield, Knowles & Devine LLC

Gamble v. R.J. Reynolds Tobacco Company, Philip Morris, Inc., Lorillard Tobacco Company,
Liggett Group LLC and Vector Group LLC
Engle Progeny Cases – Tobacco Litigation
Circuit Court of the Fourth Judicial Circuit, Duval County, Florida (Civil Division) Case
No. 08-00404-CA 32
Evidence given by deposition
December 2015
Retained by: **Estate of Donald E. Gamble**
Counsel: Robert Shields, Esq.
Leslie Bryan, Esq.
Doffermeyre, Shields, Canfield, Knowles & Devine LLC

Jordan v. R.J. Reynolds Tobacco Company, Philip Morris, Inc., Lorillard Tobacco Company,
Liggett Group LLC and Vector Group LLC
Engle Progeny Cases – Tobacco Litigation
Circuit Court of the Fourth Judicial Circuit, Duval County, Florida (Civil
Division) Case No. 2008-CA-15000
Evidence given by deposition (June 2015) and video trial testimony (video)
August 2015
Retained by: **Elaine Jordan**
Counsel: Robert Shields, Esq.
Leslie Bryan, Esq.
Doffermeyre, Shields, Canfield, Knowles & Devine LLC

Ian Ratner

CPA CA ASA CBV ABV CFE

Testimony Experience & Fiduciary Assignments



Brown v. R.J. Reynolds Tobacco Company, Philip Morris, Inc., Lorillard Tobacco Company,
Liggett Group LLC and Vector Group LLC
Engle Progeny Cases – Tobacco Litigation
Circuit Court of the Fourth Judicial Circuit, Duval County, Florida (Civil
Division) Case No. 5:09-CV-00205-D
Evidence given by deposition
January 2015 and December 2010
Retained by: **Estate of Rayfield Brown**
Counsel: Robert Shields, Esq.
Leslie Bryan, Esq.
Doffermeyre, Shields, Canfield, Knowles & Devine LLC

Taylor v. R.J. Reynolds Tobacco Company, Philip Morris, Inc., Lorillard Tobacco Company,
Liggett Group LLC and Vector Group LLC
Engle Progeny Cases – Tobacco Litigation
Circuit Court of the Fourth Judicial Circuit, Duval County, Florida (Civil Division)
Case No. 2007-CA-11654
Evidence at trial
November 2014
Retained by: **Helen Taylor**
Counsel: Robert Shields, Esq.
Leslie Bryan, Esq.
Doffermeyre, Shields, Canfield, Knowles & Devine LLC

Ellis v. R.J. Reynolds Tobacco Company, Philip Morris, Inc., Lorillard Tobacco Company,
Liggett Group LLC and Vector Group LLC
Engle Progeny Cases – Tobacco Litigation
Circuit Court of the Fourth Judicial Circuit, Duval County, Florida (Civil Division)
Case No. 2008-CA-15000
Evidence by deposition
May 2014
Retained by: **Ken Ellis, as Personal Representative of the Estate of Betty Owens**
Counsel: Robert Shields, Esq.
Leslie Bryan, Esq.
Doffermeyre, Shields, Canfield, Knowles & Devine LLC

Clayton v. R.J. Reynolds Tobacco Company, Philip Morris, Inc., Lorillard Tobacco Company,
Liggett Group LLC and Vector Group LLC
Engle Progeny Cases – Tobacco Litigation
Circuit Court of the Fourth Judicial Circuit, Duval County, Florida (Civil Division)
Case No. 2008-CA-15000
Evidence by deposition
January 2014
Retained by: **Gloria Clayton, as Personal Representative of the Estate of David Clayton**
Counsel: Robert Shields, Esq. - Doffermeyre, Shields, Canfield, Knowles &
Devine LLC Laura M. Shamp, Esq. – Laura M. Shamp, LLC

Odum v. R.J. Reynolds Tobacco Company, Philip Morris, Inc., Lorillard Tobacco Company, Liggett
Group LLC and Vector Group LLC
Engle Progeny Cases – Tobacco Litigation
Circuit Court of the Fourth Judicial Circuit, Duval County, Florida (Civil
Division) Case No. 2007-CA-11175
Evidence by deposition
February 2013
Retained by: **Sharon Odum, as Personal Representative of the Estate of Ethelene Hazouri**
Counsel: Robert Shields, Esq. - Doffermeyre, Shields, Canfield, Knowles & Devine LLC
Laura M. Shamp, Esq. – Laura M. Shamp, LLC

Ian Ratner

CPA CA ASA CBV ABV CFE

Testimony Experience & Fiduciary Assignments



Sikes v. R.J. Reynolds Tobacco Company, Philip Morris, Inc., Lorillard Tobacco Company, Liggett Group LLC and Vector Group LLC
Engle Progeny Cases – Tobacco Litigation
Circuit Court of the Fourth Judicial Circuit, Duval County, Florida (Civil Division) Case No. 2008-CA-15000
Evidence at trial and by deposition
September 2012 (trial); May 2012 (deposition)
Retained by: **Estate of Jimmie Wayne Sikes**
Counsel: Robert Shields, Esq.
Leslie Bryan, Esq.
Doffermeyre, Shields, Canfield, Knowles & Devine LLC

Sury v. R.J. Reynolds Tobacco Company, Philip Morris, Inc., Lorillard Tobacco Company, Liggett Group LLC and Vector Group LLC
Engle Progeny Cases – Tobacco Litigation
Circuit Court of the Fourth Judicial Circuit, Duval County, Florida (Civil Division) Case No. 2007-CA-11175
Evidence given by deposition
September 2011
Retained by: **Estate of Robert Sury**
Counsel: Robert Shields, Esq.
Leslie Bryan, Esq.
Doffermeyre, Shields, Canfield, Knowles & Devine LLC

Ian Ratner
CPA CA ASA CBV ABV CFE
Fiduciary Assignments



Fiduciary Assignments

In re: Le Centre on Fourth, LLC
U.S. Bankruptcy Court, Southern District of Florida, Fort Lauderdale Division
Case No. 17-23632-RBR
Ratner – Appointed Chief Restructuring Officer
November 2017

General Financial, Inc./ Lakeview Holdings, Inc. and related entities
Ratner – Appointed Chief Restructuring Officer
February 2017

Custom Teleconnect, Inc. v. Billing Concepts, Inc., et al
American Arbitration Association File No. 70-103-Y-00571-11
Ratner – Appointed Accounting Neutral
August 2012

Sousan Badii, Deceased, by and through Ramin Badii as Executor of the Estate of Sousan Badii v.
Metropolitan Hospice, Inc.
Court of Chancery, State of Delaware
C.A. No. 6192-VCP
Ratner – Appointed Receiver
March 2012

Guy & Amy Mitchell v. Vernon S. Veira, Vernon S. Veira & Associates, and W. Management Co. LLC
Eastern Caribbean Supreme Court, High Court of Justice, Saint Christopher Circuit
Claim No. SKBHCV 2009/97
Ratner – Appointed Receiver
December 2009

Stratus Group, Inc.
Stratus Holdings Group of Florida,
LLC Freeway Auto Credit, LLC
Stratus Group Equipment, LLC
U.S. Bankruptcy Court, Middle District of Georgia (Albany)
Case Nos. 08-11096, 08-11097, 08-11098, 08-11488
Ratner – Appointed Liquidating Trustee
December 2008

LEC, LLC – a Telecom Service
Provider Missouri Corporation
Ratner – Appointed Managing Member to Effect Liquidation and Dissolution
November 2008

JMV Fixed Income Arbitrage Performance Partners, Ltd., Regenmacher Holdings Limited, and
Siam Capital Management Ltd.
Eastern Caribbean Supreme Court, Anguilla
Circuit Claim No. AXA HCV 2008/0042
Ratner – Appointed Interim Receiver
July 2008

M & A Homes, LLC
U.S. Bankruptcy Court, Northern District of Georgia (Atlanta)
Case No. 07-66511(PWB)
Ratner – Appointed Chapter 7 Bankruptcy Trustee
August 2007

Ian Ratner
CPA CA ASA CBV ABV CFE
Fiduciary Assignments



Multiplan, Inc. v. Coalition America, Inc.
American Arbitration Association File No. 30 Y 181 0222 04
Ratner – Appointed Special Auditor to Arbitrator
May 2005

Scott W. Ainsworth, M.D., v. Metro Atlanta Gastroenterology, LLC et al.
American Arbitration Association File No. 30 Y 180 00188 04
Ratner – Appointed to Arbitration Panel - American Arbitration Association
April 2005

CSX Transportation, Inc. v. B&L Financial, Inc., et al.
U.S. District Court for the Northern District of Georgia (Atlanta)
Case No. 1:02-CV-2190-MHS
Ratner – Appointed Special Master
January 2004

Borden Chemicals & Plastics, OLP
U.S. Bankruptcy Court, District of
Delaware Case No. 01-1268(PJW)
Ratner – Appointed Liquidating Agent
March 2003

Florida Department of Agriculture and Consumer Services and Children's Wish Foundation
International, Inc Settlement Agreement
Ratner – Appointed Special Master Monitor
Spring – 2003

USA v. Martin Miller 94-419-01
United States District Court, District of Columbia
Evidence given by expert report and at trial
September 1999
Retained by: **United States Attorney**
Ratner – Appointed Independent Expert by Magistrate Court
Counsel: Virginia Cheatham (Washington DC)

Stephen Adkins, et al. v. Facebook, Inc.

Documents Relied Upon

Summary of Documents Relied Upon		
#	Document Description	Date
Court Documents Including Exhibits and Letters to Plaintiffs:		
1	Plaintiffs' Initial Disclosures	1/23/2019
2	Letter to Plaintiffs re Meet and Confer re Initial Disclosure	2/15/2019
3	Class Action Complaint	9/28/2018
4	Consolidated Class Action Complaint	2/7/2019
5	Amended Consolidated Class Action Complaint	8/16/2019
6	Declaration of Christopher Bream in Support of Defendants Motion ot Dismiss	3/14/2019
7	Letter from M. Blunschi producing native and metadata for document Responsive to Revised RFPS 80-84	7/18/2019
Depositions Including Exhibits:		
8	Deposition of Denise Brown-Wells	5/7/2019
9	Deposition of Jill Herr	5/8/2019
10	Deposition of Stephen Adkins	5/9/2019
11	Deposition of William Bass, Jr.	5/10/2019
Testimony Transcripts:		
12	Testimony of Colin Stretch, General Counsel, Facebook and Responses to QFR's	10/31/2017
13	Testimony of Mark Zuckerberg, CEO, Facebook	4/10/2018
Facebook Financial Information:		
14	Facebook Annual Report	2012
15	Facebook Annual Report	2013
16	Facebook Annual Report	2014
17	Facebook Annual Report	2015
18	Facebook Annual Report	2016
19	Facebook Annual Report	2017
20	Facebook Annual Report	2018
21	Facebook Q2 2018 Results - Earnings Presentation (investor.fb.com)	Q2 2018
22	Facebook's 10Q Report	6/30/2018
23	Capital IQ (based on Facebook's filed 10-K) for the Year Ended December 31, 2012.	12/31/2012
24	Capital IQ (based on Facebook's filed 10-K) for the Year Ended December 31, 2014.	12/31/2014
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26	Capital IQ (based on Facebook's filed 10-K) for the Year Ended December 31, 2018.	12/31/2018
27	Capital IQ Output for Facebook, Inc. Key Stats from Financials	2011 - 2018
28	Capital IQ Market Capitalization Output, Facebook, Inc.	2018
29	Capital IQ Output for Merger's and Acquisitions (filtered for results with announced purchase prices)	
Facebook Document Production		
30	FB-SCHMIDT - 00000198	
31	FB-SCHMIDT - 000055931 (native file - Excel)	
32	FB-SCHMIDT - 000055931 - 5948	
Other Expert Reports and Documents:		

Stephen Adkins, et al. v. Facebook, Inc.

Documents Relied Upon

Summary of Documents Relied Upon		
#	Document Description	Date
33	REDACTED - Report of James Van Dyke In Re: Anthem, Inc. Data Breach Litigation	12/2/2016
34	REDACTED - Reply Report of James Van Dyke In Re: Anthem, Inc. Data Breach Litigation	1/16/2017
35	Declaration of James Van Dyke dated August 29, 2019	8/29/2019

Research and Reference Materials:

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	Balakrishnan, Anita, Facebook Pledged to Double its 10,000-person Safety and Security Staff by end of 2018, October 31, 2017, www.cnn.com ,	10/31/2017
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	Carbone, Christopher, Facebook might have 29,000 data points on you, but Mark Zuckerberg doesn't really know, Fox News, April 11, 2018.	4/11/2018
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- 93 www.facebook.com/terms.php

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Documents Relied Upon

Summary of Documents Relied Upon		
#	Document Description	Date
94	www.ziprecruiter.com	
95	www.glassdoor.com	
96	www.lifelock.com	
97	www.bankrate.com	
98	www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yieldYear&year=2018	

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Time Spent Dealing with the Data Breach

Occupation Code	Occupation Title	Median Hourly Wage	Mean Hourly Wage
13-2000	Financial Specialist	\$22.69	\$27.67 [1]
43-3031	Bookkeeping, Accounting, and Auditing Clerks	17.08	18.22 [1]
43-6010	Secretaries and Administrative Assistants	16.73	18.73 [1]
43-6014	Secretaries and Administrative Assistants (except Legal, Medical)	15.72	16.04 [1]
	Average	\$18.06	\$20.17
	Hours required to deal with Data Breach for Mr. Adkins	1.80	1.80 [2]
	Total	\$32.50	\$36.30

Notes:

[1] May 2017 National Industry Specific Occupational Employment and Wages Estimate: NAICS 812900 – Other Personal Services, Bureau of Labor Statistics.

[2] Schedule 21.

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Time Spent Dealing with Actual Identity Theft

		Low Estimate	High Estimate	
Hourly Wage	[a]	\$18.06	\$20.17	[1]
Average Time Required per Incident (Hours)	[b]	24	24	[2]
Value of Time per Incident	[c]	\$433	\$484	[c] = [a] * [b]

Notes:

[1] Schedule 1.

[2] 2017 Norton Cyber Security Insights Report.

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Present Value of Increased Risk as Measured by Future Credit Monitoring

		ID Watchdog	LifeLock	
Annual Credit Monitoring Fee	[a]	\$219	\$330	[1]
Compounding Periods per Year	[b]	1	1	
Discount Rate per Period	[c]	2.94%	2.94%	[2]
Number of Periods (Years)	[d]	5	5	[3]
Present Value of Cash Flow	[e]	\$1,005	\$1,513	[4]
Class Members		29,000,000		

Notes:

[1] Do you Need Identity Theft Protection Services?, Sean Pyles, Nerdwallet, February 4, 2019.

[2] <https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yieldYear&year=2018>.

[3] Declaration of James Van Dyke dated August 29, 2019.

[4] $[e] = [a] * ((1 - (1 + [c])^{-[d]}) / [c])$.

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PII Based Damages by Class Member Category

Class Category	Class Members ^[1]	Median Access Rate for PII	Mean Access Rate for PII		Low Damages Estimate	High Damages Estimate
	[a]	[b]	[c]		[d] = a * b	[e] = a * c
Group 2	14,000,000	\$4.00	\$6.23	[2]	\$56,000,000	\$87,234,012
Group 1	15,000,000	\$1.00	\$2.35	[3]	\$15,000,000	\$35,254,667
Total Damages					\$71,000,000	\$122,488,678

Notes:

[1] Declaration of Christopher Bream in Support of Defendant Facebook, Inc.'s Motion to Dismiss the Consolidated Class Action Complaint, May 2, 2019.

[2] Schedule 16.

[3] Schedule 17.

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Key Facebook Financial Statistics from Period 2011 Through 2018

Dollars in Millions

Key Financials[1]								
For the Fiscal Period Ending	2011	2012	2013	2014	2015	2016	2017	2018
Total Revenue	\$3,711	\$5,089	\$7,872	\$12,466	\$17,928	\$27,638	\$40,653	\$55,838
<i>Growth Over Prior Year</i>	88.0%	37.1%	54.7%	58.4%	43.8%	54.2%	47.1%	37.4%
Gross Profit	3,070	3,921	6,114	10,313	15,061	23,849	35,199	46,483
<i>Margin %</i>	82.7%	77.0%	77.7%	82.7%	84.0%	86.3%	86.6%	83.2%
EBITDA	2,079	1,187	3,932	6,237	8,170	14,769	23,228	29,228
<i>Margin %</i>	56.0%	23.3%	49.9%	50.0%	45.6%	53.4%	57.1%	52.3%
Operating Income	1,756	538	2,921	4,994	6,225	12,427	20,203	24,913
<i>Margin %</i>	47.3%	10.6%	37.1%	40.1%	34.7%	45.0%	49.7%	44.6%
Earnings from Cont. Ops.	1,000	53	1,500	2,940	3,688	10,217	15,934	22,112
<i>Margin %</i>	26.9%	1.0%	19.1%	23.6%	20.6%	37.0%	39.2%	39.6%
Net Income	1,000	53	1,500	2,940	3,688	10,217	15,934	22,112
<i>Margin %</i>	26.9%	1.0%	19.1%	23.6%	20.6%	37.0%	39.2%	39.6%
Diluted EPS Excl. Extra Items [2]	0.46	0.01	0.6	1.1	1.29	3.49	5.39	7.57
<i>Growth Over Prior Year</i>	63.0%	(97.8%)	5,859.5%	85.2%	17.1%	170.2%	54.3%	40.4%
Currency	USD	USD	USD	USD	USD	USD	USD	USD
Exchange Rate	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Conversion Method	H	H	H	H	H	H	H	H

Notes:

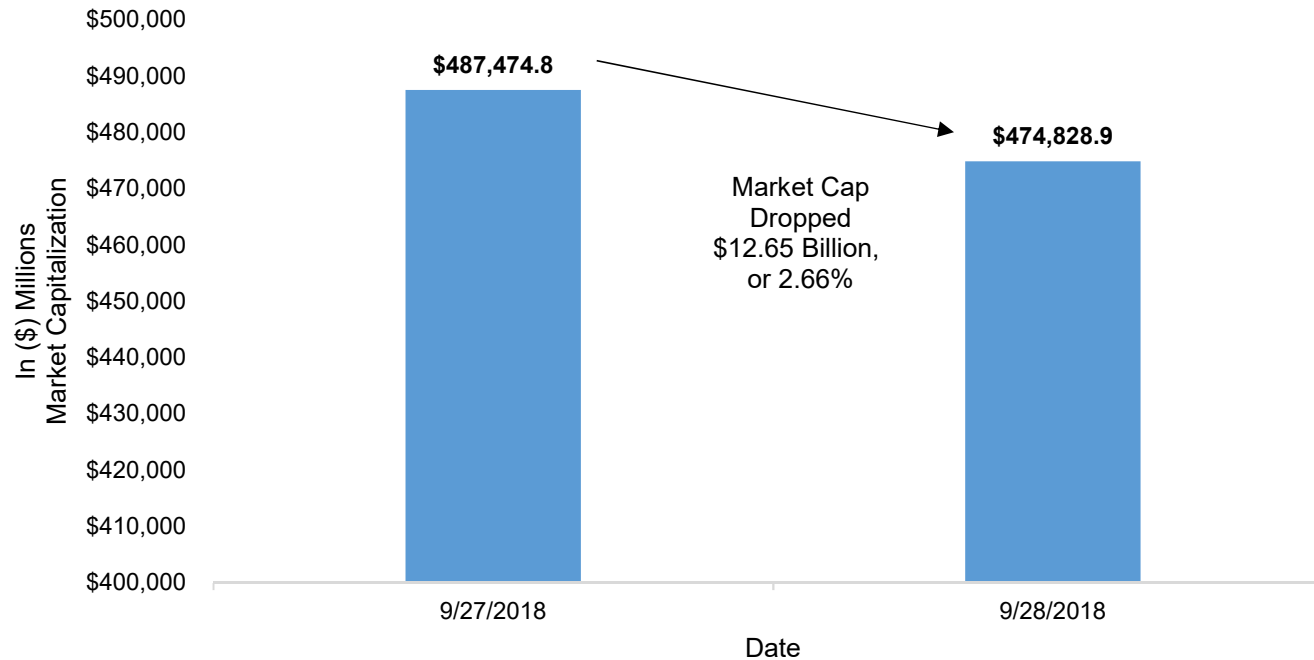
[1] Capital IQ Output for Facebook, Inc. Key Stats from Financials 2011-2018. All results are taken from the most recently filed statement for each period. When there has been more than one, earlier filings can be viewed on the individual statement pages.

[2] All forward period figures are consensus mean estimates provided by the brokers and may not be on a comparable basis as financials.

[3] Growth Rates are calculated in originally reported currency only and will not reflect any currency conversion selected above.

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Market Capitalization of Facebook Before and After September 28, 2018 Data Breach Announcement



Date	Description	Stock Price [1]	Outstanding Shares (In Millions) [1]	Market Capitalization (In Millions)
9/27/2018	Day prior to Data Breach Announcement	\$168.84	2,887.2	\$487,474.8
9/28/2018	Day of Data Breach Announcement	\$164.46	2,887.2	\$474,828.9

Notes:

[1] Capital IQ Market Capitalization Output, Facebook, Inc. 2018.

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Facebook Active User Data for the Period 2012 Through 2018

User Data In Millions

Date	Monthly Worldwide	Monthly US & Canada	Daily Worldwide	Daily US & Canada	Daily US & Canada as % of Total	Monthly US & Canada as % of Total
3/31/2012	901	183	526	129 [1]		
6/30/2012	955	186	552	130 [1]		
9/30/2012	1,007	189	584	132 [1]		
12/31/2012	1,056	193	618	135 [1]		
2012 Average	980	188	570	132	23%	19%
3/31/2013	1,110	195	665	139 [2]		
6/30/2013	1,155	198	699	142 [2]		
9/30/2013	1,189	199	728	144 [2]		
12/31/2013	1,228	201	757	147 [2]		
2013 Average	1,171	198	712	143	20%	17%
3/31/2014	1,276	202	802	150 [2]		
6/30/2014	1,317	204	829	152 [2]		
9/30/2014	1,350	206	864	155 [2]		
12/31/2014	1,393	208	890	157 [2]		
2014 Average	1,334	205	846	154	18%	15%
3/31/2015	1,441	210	936	161 [3]		
6/30/2015	1,490	213	968	164 [3]		
9/30/2015	1,545	217	1,007	167 [3]		
12/31/2015	1,591	219	1,038	169 [3]		
2015 Average	1,517	215	987	165	17%	14%
3/31/2016	1,654	222	1,090	173 [3]		
6/30/2016	1,712	226	1,128	175 [3]		
9/30/2016	1,788	229	1,179	178 [3]		
12/31/2016	1,860	231	1,227	180 [3]		
2016 Average	1,754	227	1,156	177	15%	13%
3/31/2017	1,936	234	1,284	182 [3]		
6/30/2017	2,006	236	1,325	183 [3]		
9/30/2017	2,072	239	1,368	185 [3]		
12/31/2017	2,129	239	1,401	184 [3]		
2017 Average	2,036	237	1,345	184	14%	12%
3/31/2018	2,196	241	1,449	185 [4]		
6/30/2018	2,234	241	1,471	185 [4]		
9/30/2018	2,271	242	1,495	185 [4]		
12/31/2018	2,320	242	1,523	186 [4]		
2018 Average	2,255	242	1,485	185	12%	11%

Notes:

- [1] Facebook, Inc. 2012 Annual Report.
[2] Facebook, Inc. 2014 Annual Report.
[3] Facebook, Inc. 2017 Annual Report.
[4] Facebook, Inc. 2018 Annual Report.

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Calculation of Facebook Revenue per User for the Period 2012 Through 2018

Dollars in Millions

User Counts in Millions

		2012	2013	2014	2015	2016	2017	2018	Total	%
[a] US & Canada		\$2,532	\$3,695	\$5,865	\$8,949	\$14,068	\$19,949	\$27,018	\$82,076	49%
[b] Europe		\$1,455	\$2,193	\$3,396	\$4,486	\$6,562	\$9,878	\$13,802	\$41,772	25%
[c] Asia- Pacific		\$605	\$1,063	\$1,831	\$2,722	\$4,390	\$6,763	\$9,588	\$26,962	16%
[d] Rest of World		\$497	\$921	\$1,374	\$1,770	\$2,618	\$4,063	\$5,430	\$16,673	10%
[e] Total Revenue ^[1]	= [a] + [b] + [c] + [d]	\$5,089	\$7,872	\$12,466	\$17,927	\$27,638	\$40,653	\$55,838	\$167,483	100%
[f] Total Global Net Income	= [e] * [g]	\$53	\$1,500	\$2,940	\$3,688	\$10,217	\$15,933.98	\$22,111.96		
[g] Net Income Margin ^[2]		1%	19%	24%	21%	37%	39%	40%		
[h] Total Global User Counts ^[1]		980	1,171	1,334	1,517	1,754	2,036	2,255		
[i] Net Income per User (Total)	= [e] / [h]	\$5.19	\$6.72	\$9.34	\$11.82	\$15.76	\$19.97	\$24.76		
[j] Estimated US Net Income	= [a] / [g]	\$26	\$704	\$1,383	\$1,841	\$5,201	\$7,819	\$10,699		
[k] US User Counts ^[1]		188	198	205	215	227	237	242		
[l] Estimated Revenue per User (US)	= [e] / [k]	\$27	\$40	\$61	\$83	\$122	\$172	\$231		
[m] Non-US Income	= [f] - [j]	\$27	\$796	\$1,557	\$1,847	\$5,016	\$8,115	\$11,413		
[n] Non-US User Counts	= [h] - [k]	\$792	\$973	\$1,129	\$1,302	\$1,527	\$1,799	\$2,013		
[o] Revenue per User (Non US)	= [e] / [n]	\$6	\$8	\$11	\$14	\$18	\$23	\$28		
[p] US Earnings %	= [j] / [f]	50%	47%	47%	50%	51%	49%	48%		
[q] Non-US Earnings %	= [m] / [f]	50%	53%	53%	50%	49%	51%	52%		
[r] US Revenue CAGR (2012-2018)	= ([a] 2018 / [a] 2012) ^ (1/6) - 1	48.4%								
[s] Total Revenue CAGR (2012-2018)	= ([e] 2018 / [e] 2012) ^ (1/6) - 1	49.1%								
[t] US User CAGR (2012-2018)	= ([k] 2018 / [k] 2012) ^ (1/6) - 1	4.3%								
[u] Non-US User CAGR (2012-2018)	= ([n] 2018 / [n] 2012) ^ (1/6) - 1	16.8%								
[v] Global User CAGR (2012-2018)		14.9%								

Notes:

[1] See Facebook 2012, 2014, 2017, 2018 Annual Reports.

[2] Capital IQ Output for Facebook, Inc. Key Stats from Financials 2011-2018.

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Comparison of Facebook Earnings per User: US v. Non US Users 2012 - 2018

in Millions (except Earnings per User)

	2012	2013	2014	2015	2016	2017	2018	Total	%
US & Canada	\$2,532	\$3,695	\$5,865	\$8,949	\$14,068	\$19,949	\$27,018	\$82,076	49%
Europe	\$1,455	\$2,193	\$3,396	\$4,486	\$6,562	\$9,878	\$13,802	\$41,772	25%
Asia- Pacific	\$605	\$1,063	\$1,831	\$2,722	\$4,390	\$6,763	\$9,588	\$26,962	16%
Rest of World	\$497	\$921	\$1,374	\$1,770	\$2,618	\$4,063	\$5,430	\$16,673	10%
Total Revenue	\$5,089	\$7,872	\$12,466	\$17,927	\$27,638	\$40,653	\$55,838	\$167,483	100%
Net Income Margin	1%	19%	24%	21%	37%	39%	40%		
Total Net Income	\$53	\$1,500	\$2,940	\$3,688	\$10,217	\$15,934	\$22,112		
Total Users	980	1,171	1,334	1,517	1,754	2,036	2,255		
Earnings per User (Total)	\$0	\$1	\$2	\$2	\$6	\$8	\$10		
[a] Estimated US Net Income	\$26	\$704	\$1,383	\$1,841	\$5,201	\$7,819	\$10,699		
[b] US User Counts	188	198	205	215	227	237	242		
[c] Estimated Net Income per User (US) = [a] / [b]	\$0	\$4	\$7	\$9	\$23	\$33	\$44		
[d] Non-US Income	\$27	\$796	\$1,557	\$1,847	\$5,016	\$8,115	\$11,413		
[e] Non-US User Counts	792	973	1,129	1,302	1,527	1,799	2,013		
[f] Net Income per User (Non US) = [d] / [e]	\$0	\$1	\$1	\$1	\$3	\$5	\$6		

Notes:

[1] See Facebook 2012, 2014, 2017, 2018 Annual Reports.

[2] Capital IQ Output for Facebook, Inc. Key Stats from Financials 2011-2018.

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Calculation of Facebook Market Capitalization per User for the Period 2011 Through 2018

Dollars in Millions (except per User)

User Counts in Millions

		2012	2013	2014	2015	2016	2017	2018
[a]	Facebook Market Cap [4]		\$138,820	\$217,508	\$295,978	\$331,594	\$512,759	\$376,725
[b]	US User Count	188	198	205	215	227	237	242
[c]	Non-US User Count [3]	792	973	1,039	1,302	1,527	1,799	2,013
[d]	Total User Count [3]	= [b] + [c]	980	1,171	1,244	1,517	1,754	2,255
[e]	Value per User (Total)	= [a] / [d]	\$118.5	\$174.8	\$195.1	\$189.0	\$251.8	\$167.1
[f]	US Earnings % [3]	50%	47%	47%	50%	51%	49%	48%
[g]	Non-US Earnings % [3]	50%	53%	53%	50%	49%	51%	52%
[h]	Market Cap Value attributed to US Users	= [a] * [f]	\$65,160	\$102,333	\$147,750	\$168,778	\$251,618	\$182,284
[i]	Market Cap Value attributed to Non-US Users	= [a] * [g]	\$73,660	\$115,175	\$148,228	\$162,815	\$261,141	\$194,441
[j]	Market Cap Value per US User	= [h] / [b]	\$329	\$499	\$687	\$744	\$1062	\$753
[k]	Market Cap Value per Non-US User	= [i] / [c]	\$76	\$111	\$114	\$107	\$145	\$97

Notes:

[1] See Facebook 2012, 2014, 2017, 2018 Annual Reports.

[2] Capital IQ Output for Facebook, Inc. Key Stats from Financials 2011-2018.

[3] See Schedule 8.

[4] Capital IQ Market Capitalization Index for Facebook, Inc.

Dates	[A]	[B]	[C] = [A] * [B]
	Facebook, Inc. - Share Pricing [A]	Facebook, Inc. Outstanding Shares [B]	Market Capitalization of Facebook, Inc. [C]
Dec-31-2013	\$54.65	2,540	\$138,820
Dec-31-2014	\$78.02	2,788	\$217,508
Dec-31-2015	\$104.66	2,828	\$295,978
Dec-30-2016	\$115.05	2,882	\$331,594
Dec-29-2017	\$176.46	2,906	\$512,759
Dec-31-2018	131.09	2,874	\$376,725

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Facebook, Inc. Asset Book Value Compared to Market Capitalization

Dollars In Millions

		Sep-30-2018 [1]
Cash And Equivalents		\$9,637
Short Term Investments		31,569
Accounts Receivable		\$6,058
Prepaid Exp.		\$1,876
Restricted Cash		7
Other Current Assets		-
Gross Property, Plant & Equipment		\$27,196
Accumulated Depreciation		(6,084)
Goodwill		\$18,304
Other Intangibles		1,451
Other Long-Term Assets		2,438
Total Balance Sheet Assets	[a]	\$92,452
Comparison of Market Cap and Assets		
Market Capitalization as of September 2018	[b]	\$487,475 [2]
Excess of Market Cap Over Assets	[c] = b - a	\$395,023
Percentage of Off-Book Assets	[d] = c / b	81%

Notes:

[1] Facebook Inc.'s June 30, 2018 10Q Report.

[2] Schedule 6.

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Facebook Income Statement For The Period December 31, 2011 Through December 31, 2018

Dollars in Millions

Row	Description	Summary of Income Statements For the Years Ended December 31,															
		2011 [1]	%	2012 [1]	%	2013 [2]	%	2014 [2]	%	2015 [3]	%	2016 [3]	%	2017 [3]	%	2018 [4]	%
1	Revenue	\$3,711.0	100.0%	\$5,089.0	100.0%	\$7,872.0	100.0%	\$12,466.0	100.0%	\$17,928.0	100.0%	\$27,638.0	100.0%	\$40,653.0	100.0%	\$55,838.0	100.0%
2	Other Revenue	-		-		-		-		-		-		-		-	
3	Total Revenue	3,711.0	100.0%	5,089.0	100.0%	7,872.0	100.0%	12,466.0	100.0%	17,928.0	100.0%	27,638.0	100.0%	40,653.0	100.0%	55,838.0	100.0%
4	Cost Of Goods Sold	641.0	17.3%	1,168.0	23.0%	1,758.0	22.3%	2,153.0	17.3%	2,867.0	16.0%	3,789.0	13.7%	5,454.0	13.4%	9,355.0	16.8%
5	Gross Profit	3,070.0	82.7%	3,921.0	77.0%	6,114.0	77.7%	10,313.0	82.7%	15,061.0	84.0%	23,849.0	86.3%	35,199.0	86.6%	46,483.0	83.2%
6	Selling General & Admin Exp.	926.0	25.0%	1,984.0	39.0%	1,778.0	22.6%	2,653.0	21.3%	4,020.0	22.4%	5,503.0	19.9%	7,242.0	17.8%	11,297.0	20.2%
7	R & D Exp.	388.0	10.5%	1,399.0	27.5%	1,415.0	18.0%	2,666.0	21.4%	4,816.0	26.9%	5,919.0	21.4%	7,754.0	19.1%	10,273.0	18.4%
8	Other Operating Exp., Total	1,314.0	35.4%	3,383.0	66.5%	3,193.0	40.6%	5,319.0	42.7%	8,836.0	49.3%	11,422.0	41.3%	14,996.0	36.9%	21,570.0	38.6%
9	Operating Income	1,756.0	47.3%	538.0	10.6%	2,921.0	37.1%	4,994.0	40.1%	6,225.0	34.7%	12,427.0	45.0%	20,203.0	49.7%	24,913.0	44.6%
10	Interest Expense	(42.0)	-1.1%	(51.0)	-1.0%	(56.0)	-0.7%	(23.0)	-0.2%	(23.0)	-0.1%	(10.0)	0.0%	(6.0)	0.0%	(9.0)	0.0%
11	Interest and Invest. Income	4.0	0.1%	14.0	0.3%	19.0	0.2%	27.0	0.2%	52.0	0.3%	176.0	0.6%	398.0	1.0%	661.0	1.2%
12	Net Interest Exp.	(38.0)	-1.0%	(37.0)	-0.7%	(37.0)	-0.5%	4.0	0.0%	29.0	0.2%	166.0	0.6%	392.0	1.0%	652.0	1.2%
13	Currency Exchange Gains (Loss)	(29.0)	-0.8%	(9.0)	-0.2%	(14.0)	-0.2%	(87.0)	-0.7%	(66.0)	-0.4%	(76.0)	-0.3%	(6.0)	0.0%	(213.0)	-0.4%
14	Other Non-Operating Inc. (Exp.)	6.0	0.2%	2.0	0.0%	1.0	0.0%	(1.0)	0.0%	6.0	0.0%	1.0	0.0%	5.0	0.0%	9.0	0.0%
15	EBT Excl. Unusual Items	1,695.0	45.7%	494.0	9.7%	2,871.0	36.5%	4,910.0	39.4%	6,194.0	34.5%	12,518.0	45.3%	20,594.0	50.7%	25,361.0	45.4%
16	Asset Write-down	-		-		(117.0)	-1.5%	-		-		-		-		-	
17	EBT Incl. Unusual Items	1,695.0	45.7%	494.0	9.7%	2,754.0	35.0%	4,910.0	39.4%	6,194.0	34.5%	12,518.0	45.3%	20,594.0	50.7%	25,361.0	45.4%
18	Income Tax Expense	695.0	18.7%	441.0	8.7%	1,254.0	15.9%	1,970.0	15.8%	2,506.0	14.0%	2,301.0	8.3%	4,660.0	11.5%	3,249.0	5.8%
19	Earnings from Cont. Ops.	1,000.0	26.9%	53.0	1.0%	1,500.0	19.1%	2,940.0	23.6%	3,688.0	20.6%	10,217.0	37.0%	15,934.0	39.2%	22,112.0	39.6%
20	Earnings of Discontinued Ops.	-		-		-		-		-		-		-		-	
21	Extraord. Item & Account. Change	-		-		-		-		-		-		-		-	
22	Net Income to Company	1,000.0	26.9%	53.0	1.0%	1,500.0	19.1%	2,940.0	23.6%	3,688.0	20.6%	10,217.0	37.0%	15,934.0	39.2%	22,112.0	39.6%
23	Minority Int. in Earnings	-		-		-		-		-		-		-		-	
24	Net Income	\$1,000.0	26.9%	\$53.0	1.0%	\$1,500.0	19.1%	\$2,940.0	23.6%	\$3,688.0	20.6%	\$10,217.0	37.0%	\$15,934.0	39.2%	\$22,112.0	39.6%
25	Diluted EPS	<u>\$0.46</u>	<u>0.0%</u>	<u>\$0.01</u>	<u>0.0%</u>	<u>\$0.6</u>	<u>0.0%</u>	<u>\$1.1</u>	<u>0.0%</u>	<u>\$1.29</u>	<u>0.0%</u>	<u>\$3.49</u>	<u>0.0%</u>	<u>\$5.39</u>	<u>0.0%</u>	<u>\$7.57</u>	<u>0.0%</u>
26	Supplemental Items																
27	EBITDA	<u>\$2,079.0</u>	<u>56.0%</u>	<u>\$1,187.0</u>	<u>23.3%</u>	<u>\$3,932.0</u>	<u>49.9%</u>	<u>\$6,237.0</u>	<u>50.0%</u>	<u>\$8,170.0</u>	<u>45.6%</u>	<u>\$14,769.0</u>	<u>53.4%</u>	<u>\$23,228.0</u>	<u>57.1%</u>	<u>\$29,228.0</u>	<u>52.3%</u>

Notes:

- [1] Imported from Capital IQ (based on Company's filed 10-K) for the Year Ended December 31, 2012.
- [2] Imported from Capital IQ (based on Company's filed 10-K) for the Year Ended December 31, 2014.
- [3] Imported from Capital IQ (based on Company's filed 10-K) for the Year Ended December 31, 2017.
- [4] Imported from Capital IQ (based on Company's filed 10-K) for the Year Ended December 31, 2018.

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Calculation of Increased Facebook Data Security Spend

Assumptions:

Burden Rate [1]	1.3
Additional Data Security Personnel [2]	10,000

		Year	ZipRecruiter	GlassDoor	Facebook Values ^[5]
Estimated Data Security Salary [3]	[a]		\$90,041	\$122,500	
Estimated Burden Rate [4]	[b]		1.30	1.30	
Average Cost to Facebook per Data Security Employee	[c] = [a] * [b]		\$117,053	\$159,250	\$213,919
Increase in Data Security Personnel Needed in 2017 [2]	[d]		10,000	10,000	10,000
Increased Data Security Spend Needed in 2017	[e] = [c] * [d]	2017	\$1,170,533,000	\$1,592,500,000	\$2,139,190,919

Notes:

[1] See Bureau of Labor Statistics News Release, "Employer Costs for Employee Compensation - June 2018", Page 4, dated September 18, 2018.

[2] Hearing Before the United States Senate Committee on the Judiciary Subcommittee on Crime and Terrorism: Testimony of Colin Stretch, General Counsel, Facebook, October 31, 2017.

[3] See www.ziprecruiter.com/Salaries/Entry-Level-Cyber-Security-Analyst-Salary, accessed 11/28/18. The majority of salaries range from \$54,400 (25th percentile) to \$120,000 (75th percentile) across the United States. In the Los Angeles market, the average annual salary for this position is \$95,222 (6%) more than the national average.

See www.glassdoor.com/Salary/Facebook-Salaries, accessed 11/28/18.

[4] See Bureau of Labor Statistics News Release, "Employer Costs for Employee Compensation - June 2018", Page 4, dated September 18, 2018.

[5] Schedule 19.

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Facebook, Inc.'s Acquisitions with Announced Purchase Prices

	Transaction ID	Announced Date [1]	Closed Date	Target	Sellers	User Counts (In Millions) [2]	Purchase Price (In Millions)	Price Per User
1	IQTR129618484	8/15/2010	8/15/2010	Chai Labs, Inc.	Merus Capital Seller Funds: Merus Capital Fund I, L.P.	N/A	\$10.0	
2	IQTR128799392	3/20/2011	3/30/2011	Snaptu Ltd.	Carmel Ventures (nka: Viola Ventures); Crowded Ocean Inc.; Sequoia Capital Israel	N/A	70.0	
3	IQTR245954377	4/9/2012	6/15/2012	AOL Inc., Patents and License to Retained Patent Portfolio	Oath Inc.	N/A	1,056.0	
4	IQTR183970954	4/9/2012	8/31/2012	Instagram, Inc.	Andreessen Horowitz LLC; Baseline Ventures; Benchmark; Greylock Capital Management, LLC; Greylock Partners; Lowercase Capital; Sequoia Capital; Thrive Capital Seller Funds: Andreessen Horowitz L.P.	30	1,010.5	33.7
5	IQTR209227462	6/18/2012	6/18/2012	Face.com	Rhodium Ltd.; Yandex LLC	N/A	60.0	
6	IQTR248298503	10/13/2013	10/31/2013	Onavo Mobile Ltd.	Horizons Ventures Limited; Magma Venture Partners; Motorola Mobility Ventures; Sequoia Capital Israel	N/A	150.0	
7	IQTR253870171	1/7/2014	1/7/2014	Little Eye Software Labs Pvt Ltd.	GSF India; TA Ventures; Ventureast Fund Advisors India Limited	N/A	14.5	
8	IQTR254089377	1/13/2014	1/13/2014	Branch Media, Inc.	Betaworks Ventures Management, Llc; BoxGroup; Lerer Hippeau Ventures; SV Angel	N/A	15.0	
9	IQTR257175251	2/19/2014	10/6/2014	WhatsApp Inc.	Sequoia Capital	450	20,117.0	44.7
10	IQTR260951425	3/25/2014	7/21/2014	Facebook Technologies, LLC	Andreessen Horowitz LLC; Formation8 Partners; Founders Fund; Matrix Partners; Spark Capital Partners, LLC Seller Funds: Formation8 Partners Fund I, L.P.	N/A	2,160.7	
11	IQTR261260751	3/27/2014	3/27/2014	Ascenta (UK) Limited		N/A	20.0	
12	IQTR267313633	7/2/2014	7/31/2014	LiveRail, Inc.	Pond Venture Partners Ltd.	N/A	500.0	
13	IQTR283907807	2/6/2015	2/6/2015	Menlo Science & Technology Park	Prologis, Inc. (NYSE:PLD)	N/A	\$400.0	

Notes:

[1] Capital IQ Output for Merger's and Acquisitions filtered for results with announced purchase prices.

[2] Purchased companies either do not have users or the number of users were not publicly disclosed. See <https://fortune.com/2017/07/28/whatsapp-one-billion-daily-users/> and <https://www.newsweek.com/facebook-own-instagram-does-companies-apps-data-860732>

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User-Based Value Estimates of PII Categories

PII Categories	Price [1]	Group 2 Class [2]	Group 1 Class [2]
Passwords (Login Details)	\$75.80		
Health Condition	59.80		
Social Security Number	55.70		
Payment Details (Credit Card)	36.00		
Credit History	29.20		
Names of Friends and Family Members	23.50	\$23.50	
Purchase Histories	20.60		
Physical Location (GPS)	16.10	16.10	
School or Employer	13.30	13.30	
Home Address	12.90	12.90	
Photos & Videos	12.20		
Hobbies, Tastes & Preferences	12.20		
Marital Status	8.30	8.30	
Email Addresses	8.00	8.00	\$8.00
Browser Settings & Histories	7.10	7.10	
Special Dates including DOB	5.90	5.90	
Phone Numbers	5.90	5.90	5.90
Name	3.90	3.90	
Gender	2.90	2.90	
Totals	\$409.30	\$107.80	\$13.90

Notes:

- [1] Privacy and Security in a Connected Life: A Study of US, European and Japanese Consumers, Ponemon Institute, LLC, March 2015. https://www.trendmicro.de/cloud-content/us/pdfs/security-intelligence/reports/rt_privacy_and_security_in_a_connected_life.pdf.
- [2] Declaration of Christopher Bream in Support of Defendant Facebook, Inc.'s Motion to Dismiss the Consolidated Class Action Complaint, May 2, 2019.

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Summary of Social Media Login Credentials ("PII") Market Values on the Dark Web

	Type of Account	Market Item Description/Article's Item Description	Detail	Category	Date	Price/Value on Dark Web per User Account	Publication	Source / Additional Information	Market	Notes
1	Facebook	1 Hacked facebook account	Login Credentials	Social Media	March-15	\$4.99	InfoSec	https://resources.infosecinstitute.com/buying-personal-information-in-the-deep-web/#gref , Accessed 7/3/18.	Black Bank	
2	Facebook	"FACEBOOK.COM HACKED ACCOUNT	Login Credentials	Social Media	February-18	\$5.00	Top 10 VPN	Dark Web Market Price Index Feb 2018.pdf, Accessed 7/3/18.	Dream	
3	Instagram	"INSTAGRAM HACKED ACCOUNT"	Login Credentials	Social Media	February-18	\$1.28	Top 10 VPN	Dark Web Market Price Index Feb 2018.pdf, Accessed 7/3/18.	Dream	
4	Linkedin	"LINKEDIN .COM LOGINS AUTO DISPATCH SYST	Login Credentials	Social Media	February-18	\$2.07	Top 10 VPN	Dark Web Market Price Index Feb 2018.pdf, Accessed 7/3/18.	Dream	
5	Twitter	"Twitter Aged accounts"	Login Credentials	Social Media	February-18	\$1.66	Top 10 VPN	Dark Web Market Price Index Feb 2018.pdf, Accessed 7/3/18.	Dream	
6	Facebook	Access to social media account	Login Credentials	Social Media	June-18	\$3.66	Money Guru	https://www.moneyguru.com/insights/how-much-is-your-data-really-worth-to-criminals	N/A	UK study
7	Instagram	Access to social media account	Login Credentials	Social Media	June-18	\$5.85	Money Guru	https://www.moneyguru.com/insights/how-much-is-your-data-really-worth-to-criminals	N/A	UK study
8	Pinterest	Access to social media account	Login Credentials	Social Media	June-18	\$7.93	Money Guru	https://www.moneyguru.com/insights/how-much-is-your-data-really-worth-to-criminals	N/A	UK study
9	Reddit	Access to social media account	Login Credentials	Social Media	June-18	\$1.95	Money Guru	https://www.moneyguru.com/insights/how-much-is-your-data-really-worth-to-criminals	N/A	UK study
10	Twitter	Access to social media account	Login Credentials	Social Media	June-18	\$3.05	Money Guru	https://www.moneyguru.com/insights/how-much-is-your-data-really-worth-to-criminals	N/A	UK study
11	Facebook	"Hackers are selling Facebook logins for just \$2.60 on the dark web, according to new research."	Login Credentials	Social Media	October-18	\$2.60	Money Guru	https://nypost.com/2018/10/01/hackers-are-selling-facebook-logins-on-the-dark-web-for-2/ , Accessed 7/29/19	N/A	UK study
12	Facebook	Hacked Facebook Account	Login Credentials	Social Media	October-18	\$12.48	The Independent	https://www.independent.co.uk/life-style/gadgets-and-tech/news/facebook-hack-data-dark-web-login-details-cost-dream-market-a8564671.html , accessed 7/24/19.	Dream	
13	Facebook	Hack Facebook Account	Login Credentials	Social Media	October-18	\$3.12	The Independent	https://www.independent.co.uk/life-style/gadgets-and-tech/news/facebook-hack-data-dark-web-login-details-cost-dream-market-a8564671.html , accessed 7/24/19.	Dream	
14	Facebook	1x Facebook Account email:pw Phished	Login Credentials	Social Media	February-19	\$29.61	Top 10 VPN	https://www.top10vpn.com/assets/2019/02/Dark-Web-Market-Price-Index-2019.pdf , accessed 7/5/19.	Dream	
15	Facebook	Hacked Facebook Account	Login Credentials	Social Media	February-19	\$12.48	Top 10 VPN	https://www.top10vpn.com/assets/2019/02/Dark-Web-Market-Price-Index-2019.pdf , accessed 7/5/19	Dream	
16	Facebook	HQ FACEBOOK ACCOUNTS + INFO	Login Credentials	Social Media	February-19	\$10.00	Top 10 VPN	https://www.top10vpn.com/assets/2019/02/Dark-Web-Market-Price-Index-2019.pdf , accessed 7/5/19.	Wallstreet	
17	Facebook	FACEBOOK ACCOUNTS INSTANT DELIVERY	Login Credentials	Social Media	February-19	\$9.99	Top 10 VPN	https://www.top10vpn.com/assets/2019/02/Dark-Web-Market-Price-Index-2019.pdf , accessed 7/5/19.	Empire	
18	Facebook	Hacked Facebook account	Login Credentials	Social Media	February-19	\$4.16	Top 10 VPN	https://www.top10vpn.com/assets/2019/02/Dark-Web-Market-Price-Index-2019.pdf , accessed 7/5/19.	Dream	
19	Facebook	Hacked Facebook account	Login Credentials	Social Media	February-19	\$4.00	Top 10 VPN	https://www.top10vpn.com/assets/2019/02/Dark-Web-Market-Price-Index-2019.pdf , accessed 7/5/19.	Wallstreet	
20	Facebook	Random cracked FACEBOOK Account [LIFETIME WARRANTY]	Login Credentials	Social Media	February-19	\$2.50	Top 10 VPN	https://www.top10vpn.com/assets/2019/02/Dark-Web-Market-Price-Index-2019.pdf , accessed 7/5/19.	Wallstreet	
21	Facebook	FACEBOOK US ACCOUNTS BRUTE	Login Credentials	Social Media	February-19	\$0.19	Top 10 VPN	https://www.top10vpn.com/assets/2019/02/Dark-Web-Market-Price-Index-2019.pdf , accessed 7/5/19.	Wallstreet	
22	Reddit	Reddit Accounts Random	Login Credentials	Social Media	February-19	\$11.39	Top 10 VPN	https://www.top10vpn.com/assets/2019/02/Dark-Web-Market-Price-Index-2019.pdf , accessed 7/5/19.	Berlusconi	
23	Reddit	REDDIT ACCOUNT 1\$/Each INSTANT DELIVERY	Login Credentials	Social Media	February-19	\$1.04	Top 10 VPN	https://www.top10vpn.com/assets/2019/02/Dark-Web-Market-Price-Index-2019.pdf , accessed 7/5/19.	Dream	
24	Twitter	Random Cracked TWITTER ACCOUNT (LIFETIME)	Login Credentials	Social Media	February-19	\$2.50	Top 10 VPN	https://www.top10vpn.com/assets/2019/02/Dark-Web-Market-Price-Index-2019.pdf , accessed 7/5/19.	Wallstreet	

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Summary of Social Media Login Credentials ("PII") Market Values on the Dark Web

	Type of Account	Market Item Description/Article's Item Description	Detail	Category	Date	Price/Value on Dark Web per User Account	Publication	Source / Additional Information	Market	Notes
25	Twitter	Twitter ACCOUNTS LIFETIME	Login Credentials	Social Media	February-19	\$1.54	Top 10 VPN	https://www.top10vpn.com/assets/2019/02/Dark-Web-Market-Price-Index-2019.pdf , accessed 7/5/19.	Dream	
26	Facebook	HACKED FACEBOOK ACCOUNT ++++	Login Credentials	Social Media	June-19	\$16.80	Top 10 VPN	Top10VPN-Dark-Web-Market-Price-Index-June-2019-UK-Update.pdf, Accessed 7/3/19.	Berlusconi	UK study
27	Facebook	Hacked Facebook Account	Login Credentials	Social Media	June-19	\$12.36	Top 10 VPN	Top10VPN-Dark-Web-Market-Price-Index-June-2019-UK-Update.pdf, Accessed 7/3/19.	Nightmare	UK study
28	Facebook	Hacked Facebook Account	Login Credentials	Social Media	June-19	\$4.00	Top 10 VPN	Top10VPN-Dark-Web-Market-Price-Index-June-2019-UK-Update.pdf, Accessed 7/3/19.	Tochka	UK study
29	Twitter	Twitter accounts: Usually \$2-\$3	Login Credentials	Social Media	N/A	\$2.50	LogDog	http://staging.idnotify.com/id-notify-how-much-is-your-uber-account-worth-on-the-dark-web/ .	N/A	

	Social Media Market Summary Statistics	Statistics (Exc. Outlier)
Min	\$0.19	\$0.19
Max	\$29.61	\$29.61
Mean	\$6.23	\$6.01
Median	\$4.00	\$3.83

Notes:

[1] We have excluded large, unverified database sales of MySpace and LinkedIn data offered by a "tessa88" because this seller was blacklisted for delivering fake and low quality data according to InfoArmor (see "InfoArmor: Yahoo Data Breach Investigation, September 28, 2016). Likewise, we excluded certain bulk sales without any guarantees that the data can be accessed For example, one vendor the TRU team spotted offered 1,000 Instagram accounts for a price of \$15, 2,500 for \$25, 5,000 for \$40 and 10,000 for \$60 (Black Market Report: A Look Inside the Dark Web, Armor, March 2018).

[2] Although this article listed Facebook login's ranging from \$50-\$500, \$4.99 was the only example provided. See Buying Personal Information in the Deep Web.pdf, InfoSec, March 2018, Accessed 3/21/19.

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Summary of "Partial Fullz" and SSN Market Values on the Dark Web

	Type of Account	Date	Market Item Description/Article's Item Description	Category	Price/Account	Publication	Source / Additional Information	Market	Notes
1	Fullz	November-17	SSN, DOB, Full Name of US Citizens. Price Range from \$1 to \$8.	Partial Fullz	\$4.50	FlashPoint	Flashpoint_Analysis_Pricing_of_Goods_and_Services_on_DDW.pdf, Accessed 3/21/19	N/A	
2	Fullz	November-17	SSN and DOB	Partial Fullz	\$3.00	Recorded Future	https://www.recordedfuture.com/cyber-operations-cost/ https://go.recordedfuture.com/hubfs/cyber-operations-cost-appendix.pdf	N/A	
3	Fullz	February-18	USA Social security number search (SSN+DOB)	Partial Fullz	\$20.80	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-feb-2018-us/	Dream	
4	Fullz	February-18	Real Fresh US Profiles+email+SSN+DOB	Partial Fullz	\$1.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-feb-2018-us/	Wallstreet	
5	Fullz	February-19	SSN + DoB	Partial Fullz	\$11.40	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Berlusconi	
6	Fullz	February-19	Quality US Fullz (SSN-DOB-DL & MORE)\$10	Partial Fullz	\$10.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Empire	
7	Fullz	February-19	FULL INFO US (DOB SSN, Documents number)	Partial Fullz	\$9.99	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Empire	
8	Fullz	February-19	Cheapest SSN & DOB \$0.2 each!!	Partial Fullz	\$5.20	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Dream	[1]
9	Fullz	February-19	FULLZ - SSN - DOB	Partial Fullz	\$5.20	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Dream	
10	Fullz	February-19	SSN/DOB OF USA	Partial Fullz	\$5.19	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Dream	
11	Fullz	February-19	USA FULLZ with SSN, D.O.B. and DRIVERS LICENSE W/ Scans	Partial Fullz	\$5.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	
12	Fullz	February-19	USA FULL NAME DOB SSN ADDRESS	Partial Fullz	\$5.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Tochka	
13	Fullz	February-19	USA - Personal info / SSN	Partial Fullz	\$4.56	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Berlusconi	
14	Fullz	February-19	Full info, only valid info SSN, DOB, New Mexico sta...	Partial Fullz	\$3.12	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Dream	
15	Fullz	February-19	USA fullz Social Security Number and Date of Birth	Partial Fullz	\$2.99	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	
16	Fullz	February-19	Personal Information SSN - DOB, etc.	Partial Fullz	\$2.93	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Berlusconi	
17	Fullz	February-19	USA FULL (NAME DOB SSN ADDRESS)	Partial Fullz	\$2.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Tochka	
18	Fullz	February-19	Fresh USA Full SSN-DOB Instant Shipping	Partial Fullz	\$2.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	
19	Fullz	February-19	Fresh USA Full SSN-DOB Instant Shipping	Partial Fullz	\$2.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	
20	Fullz	February-19	HQ Random Fullz US SSN/DOB with Marital Profile	Partial Fullz	\$2.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	

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Summary of "Partial Fullz" and SSN Market Values on the Dark Web

	Type of Account	Date	Market Item Description/Article's Item Description	Category	Price/Account	Publication	Source / Additional Information	Market	Notes
21	Fullz	February-19	FRESH USA FULLZ (SSN+DOB) \$1	Partial Fullz	\$0.99	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Empire	
22	Fullz	February-19	US FULLZ INFO SSN+DOB MISSOURI (MO) \$0.49	Partial Fullz	\$0.49	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	
23	Fullz	February-19	US SSN + DOB Minnesota (MN) \$0.49	Partial Fullz	\$0.49	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	
24	Fullz	February-19	US SSN + DOB Oklahoma (OK) \$0.19 SALE	Partial Fullz	\$0.19	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	
25	Fullz	February-19	US SSN + DOB Idaho (ID) \$0.19	Partial Fullz	\$0.19	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	

26	SSN	February-18	SSN	SSN	\$1.00	Texas Data Solutions	https://www.texasdatasolutions.com/shining-a-light-on-the-dark-web-how-much-is-your-personal-information-selling-for/	N/A	
27	SSN	February-18	USA KIDS SSN	SSN	\$2.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-feb-2018-us/	Wallstreet	
28	SSN	September-18	SSN of a specific person	SSN	\$2.99	AARP	https://www.aarp.org/money/scams-fraud/info-2018/what-is-the-dark-web.html	N/A	
29	SSN	October-18	SSN	SSN	\$2.99	The Issues	Identity Fraud And The Dark Web - [FKD].pdf, Accessed 3/21/19	N/A	
30	SSN	December-18	SSN of a random person	SSN	\$0.05	Recorded Future	https://www.wsj.com/articles/what-happens-to-your-data-after-a-hack-1544367600	N/A	
31	SSN	December-18	SSN of a specific person	SSN	\$3.00	Recorded Future	https://www.wsj.com/articles/what-happens-to-your-data-after-a-hack-1544367600	N/A	
32	SSN	March-19	SSN	SSN	\$1.00	Experian	https://www.experian.com/blogs/ask-experian/heres-how-much-your-personal-information-is-selling-for-on-the-dark-web/	N/A	
33	SSN	2019	SSN "Your SSN can sell for as little as \$1"	SSN	\$1.00	VOX & Creditwise	https://www.theverge.com/ad/18283053/how-much-does-social-security-sell-for-on-dark-web	N/A	
34	SSN	2019	SSN Range from \$1 to \$8.	SSN	\$4.50	Truthfinder	https://www.truthfinder.com/dark-web/	N/A	

	Partial Fullz Summary Statistics	SSN Only Summary Statistics
Min	\$0.19	\$0.05
Max	\$20.80	\$4.50
Mean	\$4.41	\$2.06
Median	\$3.00	\$2.00

Value of Partial Fullz without SSN
\$0.14
\$16.30
\$2.35
\$1.00

Notes:

[1] The value of this PII is unclear as Top10vpn concluded \$5.20, but the text says \$0.20.

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Summary of "Fullz" Information Market Values on the Dark Web

	Type of Account	Date	Market Item Description/Article's Item Description	Category	Price/Value on Dark Web per User Account	Publication	Source / Additional Information	Market	Notes
1	Fullz	2013	US Fullz Full Name, Address, Phone Numbers, email address and password, DOB, SSN or EIN and one or more of the following: bank account and routing number, account type, online banking credentials in varying degrees of completeness or credit card information including full Track 2 data and any associated PIN	Fullz with Financial Information	\$25.00	Dell SecureWorks	https://www.secureworks.com/resources/wp-underground-hacking-markets-report	N/A	
2	Fullz	2014	US Fullz Full Name, Address, Phone Numbers, email address and password, DOB, SSN or EIN and one or more of the following: bank account and routing number, account type, online banking credentials in varying degrees of completeness or credit card information including full Track 2 data and any associated PIN	Fullz with Financial Information	\$30.00	Dell SecureWorks	https://www.secureworks.com/resources/wp-underground-hacking-markets-report	N/A	
3	Fullz	March-15	US Fullz (excerpt example from dark web)	Fullz	\$25.00	InfoSec Institute	https://resources.infosecinstitute.com/buying-personal-information-in-the-deep-web/#gref	N/A	
4	Fullz	March-15	"Fullz is used to indicate another type of financial credential traded in the underground markets...." "...full information on a victim, with includes name, address, SSN, credit card data, DoB, MMN, DL and more" "US and UK citizen data could be acquired in lots with a cost that ranges from \$5-\$10 USD	Fullz with Financial Information	\$7.50	InfoSecInstitute	Buying Personal Information in the Deep Web.pdf, Accessed 3/21/19.	N/A	
5	Fullz	March-15	"Fullz is used to indicate another type of financial credential traded in the underground markets...." "...full information on a victim, with includes name, address, SSN, credit card data, DoB, MMN, DL and more" "US and UK citizen data could be acquired in lots with a cost up to \$40 USD for a very specific profile."	Fullz with Financial Information	\$40.00	InfoSecInstitute	Buying Personal Information in the Deep Web.pdf, Accessed 3/21/19.		
6	Fullz	June-15	USA Fullz Including First Name, Last Name, Current Home/billing address, Previous Home/billing address, City, State, Zip, Country, Mobile and/or home phone, Work phone, SSN, DOB, Mother's Maiden Name, Credit Card number.	Fullz with Financial Information	\$31.43	Armor	Cybercriminals Profit as Stolen Credit ...pdf, Accessed 3/21/19.	N/A	
7	Fullz	June-15	"Fullz is a term that refers the fill financial information of the victim including name, address, credit card information, social security number, date of birth, and more." "European Fullz are more expensive than US ones, their price varies from \$15 up to \$45"	Fullz with Financial Information	\$30.00	InfoSec Institute	https://resources.infosecinstitute.com/card-fraud-in-the-deep-web/#gref	AlphaBay Market	
8	Fullz	June-15	European Fullz Range from "25 - 45 Euros" (35 Euro / .82)	Fullz with Financial Information	\$42.68	InfoSec Institute	https://resources.infosecinstitute.com/card-fraud-in-the-deep-web/#gref	Italian Dark net Community	EU
9	Fullz	June-15	US Fullz = "offered at a starting price of 25 Euro"	Fullz with Financial Information	\$30.49	InfoSec Institute	https://resources.infosecinstitute.com/card-fraud-in-the-deep-web/#gref	Italian Dark net Community	
10	Fullz	July-15	Fullz "The listings ranged in price from less than \$1 to about \$450, converted from bitcoin. The median price for someone's identity was \$21.35".	Fullz	\$21.35	Quartz	The price of a stolen identity on the dark web — Quartz.pdf, Accessed 3/21/19	N/A	
11	Fullz	December-15	US Full Name, billing address, payment card number, expiration date, PIN number, SSN, DOB, Mother's Maiden Name, CVV2 (3-didget number on back of credit/payment card)	Fullz with Financial Information	\$30.00	McAfee Labs	https://www.mcafee.com/enterprise/en-us/assets/reports/rp-hidden-data-economy.pdf	N/A	
12	Fullz	December-15	United Kingdom. Full Name, billing address, payment card number, expiration date, PIN number, SSN, DOB, Mother's Maiden Name, CVV2 (3-didget number on back of credit/payment card).	Fullz with Financial Information	\$35.00	McAfee Labs	https://www.mcafee.com/enterprise/en-us/assets/reports/rp-hidden-data-economy.pdf	N/A	UK
13	Fullz	December-15	Canada. Full Name, billing address, payment card number, expiration date, PIN number, SSN, DOB, Mother's Maiden Name, CVV2 (3-didget number on back of credit/payment card).	Fullz with Financial Information	\$40.00	McAfee Labs	https://www.mcafee.com/enterprise/en-us/assets/reports/rp-hidden-data-economy.pdf	N/A	Canadian

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Summary of "Fullz" Information Market Values on the Dark Web

	Type of Account	Date	Market Item Description/Article's Item Description	Category	Price/Value on Dark Web per User Account	Publication	Source / Additional Information	Market	Notes
14	Fullz	December-15	Australia. Full Name, billing address, payment card number, expiration date, PIN number, SSN, DOB, Mother's Maiden Name, CVV2 (3-didget number on back of credit/payment card).	Fullz with Financial Information	\$40.00	McAfee Labs	https://www.mcafee.com/enterprise/en-us/assets/reports/rp-hidden-data-economy.pdf	N/A	Australian
15	Fullz	December-15	European Union. Full Name, billing address, payment card number, expiration date, PIN number, SSN, DOB, Mother's Maiden Name, CVV2 (3-didget number on back of credit/payment card).	Fullz with Financial Information	\$45.00	McAfee Labs	https://www.mcafee.com/enterprise/en-us/assets/reports/rp-hidden-data-economy.pdf	N/A	EU
16	Fullz	April-16	US Fullz Full Name, Address, Phone Numbers, email address and password, DOB, SSN or EIN and one or more of the following: bank account and routing number, account type, online banking credentials in varying degrees of completeness or credit card information including full Track 2 data and any associated PIN. Range from \$15 to \$65	Fullz with Financial Information	\$40.00	Dell SecureWorks	https://www.secureworks.com/resources/wp-underground-hacking-markets-report	N/A	
17	Fullz	April-16	UK Fullz - "Premium UK Fullz CVV & cards (screen shot from article)	Fullz with Financial Information	\$33.44	Dark Web News	Stolen Data Is Being Sold For Only \$1 On The Dark Web.pdf, Accessed 3/21/19	N/A	UK
18	Fullz	October-17	US Fullz	Fullz	\$25.00	Paganini	https://www.enisa.europa.eu/events/cti-eu-event/cti-eu-event-presentations/digging-into-the-dark-web/	N/A	
19	Fullz	October-17	Canada Fullz. Range from \$35 to \$50.	Fullz	\$42.50	Paganini	https://www.enisa.europa.eu/events/cti-eu-event/cti-eu-event-presentations/digging-into-the-dark-web/	N/A	Canadian
20	Fullz	October-17	UK Fullz	Fullz	\$53.00	Paganini	https://www.enisa.europa.eu/events/cti-eu-event/cti-eu-event-presentations/digging-into-the-dark-web/	N/A	UK
21	Fullz	October-17	Israel Fullz	Fullz	\$33.00	Paganini	https://www.enisa.europa.eu/events/cti-eu-event/cti-eu-event-presentations/digging-into-the-dark-web/	N/A	Israeli
22	Fullz	October-17	Russian Fullz	Fullz	\$25.00	Paganini	https://www.enisa.europa.eu/events/cti-eu-event/cti-eu-event-presentations/digging-into-the-dark-web/	N/A	Russian
23	Fullz	October-17	Turkish Fullz	Fullz	\$18.00	Paganini	https://www.enisa.europa.eu/events/cti-eu-event/cti-eu-event-presentations/digging-into-the-dark-web/	N/A	Turkish
24	Fullz	November-17	Fullz with credit score of 700+	Fullz with Financial Information	\$60.00	Flashpoint	https://www.flashpoint-intel.com/blog/pricing-analysis-deep-dark-web/ http://go.flashpoint-intel.com/docs/analysis-pricing-of-goods-and-services-on-the-ddw	N/A	
25	Fullz	November-17	Fullz with credit score of 800+	Fullz with Financial Information	\$80.00	Flashpoint	https://www.flashpoint-intel.com/blog/pricing-analysis-deep-dark-web/ http://go.flashpoint-intel.com/docs/analysis-pricing-of-goods-and-services-on-the-ddw	N/A	
26	Fullz	November-17	SSN, name, DOB, payment card number, CVV code and PIN. Premium Price Range from \$20 to \$75.	Fullz with Financial Information	\$47.50	Flashpoint	https://www.flashpoint-intel.com/blog/pricing-analysis-deep-dark-web/ http://go.flashpoint-intel.com/docs/analysis-pricing-of-goods-and-services-on-the-ddw	N/A	
27	Fullz	November-17	USA CVV Fullz and ATM Pin, 100% valid (Dark Web Screenshot)	Fullz with Financial Information	\$75.00	Flashpoint	https://www.flashpoint-intel.com/blog/pricing-analysis-deep-dark-web/ http://go.flashpoint-intel.com/docs/analysis-pricing-of-goods-and-services-on-the-ddw	N/A	
28	Fullz	November-17	SSN, DOB, Full Name of US Citizens. Price Range from \$1 to \$8.	Partial Fullz	\$4.50	FlashPoint	Flashpoint_Analysis_Pricing_of_Goods_and_Ser_vices_on_DDW.pdf, Accessed 3/21/19	N/A	

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Summary of "Fullz" Information Market Values on the Dark Web

	Type of Account	Date	Market Item Description/Article's Item Description	Category	Price/Value on Dark Web per User Account	Publication	Source / Additional Information	Market	Notes
29	Fullz	November-17	SSN and DOB	Partial Fullz	\$3.00	Recorded Future	https://www.recordedfuture.com/cyber-operations-cost/ https://go.recordedfuture.com/hubfs/cyber-operations-cost-appendix.pdf	N/A	
30	Fullz	November-17	Credit Report with Credit Score of 750+ (Would include Fullz info. in Credit Report)	Fullz with Financial Information	\$150.00	Recorded Future	https://www.recordedfuture.com/cyber-operations-cost/ https://go.recordedfuture.com/hubfs/cyber-operations-cost-appendix.pdf	N/A	
31	Fullz	December-17	Name, DOB, Address, SSN, Financials, etc	Fullz with Financial Information	\$15.00	TheNextWeb	Hackers don't care who you are — but th...pdf, Accessed 3/21/19	N/A	
32	Fullz	July 2017 - July 2018	Full biographic information, identified on dark web as Fullz. Fullz defined as "full sets of identifying information" "dossiers that provide enough financial, location and biographical details on a victim to facilitate identity theft of other impersonation-based fraud" Range from \$10 to \$25.	Fullz with Financial Information	\$17.50	Dell SecureWorks	https://www.secureworks.com/resources/rp-2018-state-of-cybercrime		
33	SSN	February-18	SSN	SSN	\$1.00	Texas Data Solutions	https://www.texasdatasolutions.com/shining-a-light-on-the-dark-web-how-much-is-your-personal-information-selling-for/	N/A	
34	Fullz	February-18	Female selfie + ID both sides + utility bill	Fullz with Financial Information	\$64.08	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-feb-2018-us/	Dream	
35	Fullz	February-18	SELFIE USA DRIVER'S LICENSE SCAN SSN UTILITY BILL	Fullz with Financial Information	\$64.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-feb-2018-us/	Dream	
36	Fullz	February-18	SELFIE USA DRIVER'S LICENSE SCAN SSN UTILITY BILL	Fullz with Financial Information	\$64.08	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-feb-2018-us/	Dream	
37	Fullz	February-18	USA Social security number search (SSN+DOB)	Partial Fullz	\$20.80	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-feb-2018-us/	Dream	
38	Fullz	February-18	Only Male US SSN, DL, DOB, EMAIL, FICO	Fullz with Financial Information	\$20.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-feb-2018-us/	Wallstreet	
39	SSN	February-18	USA KIDS SSN	SSN	\$2.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-feb-2018-us/	Wallstreet	
40	Fullz	February-18	Fresh US Full Name + Credit Report + Email	Fullz with Financial Information	\$1.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-feb-2018-us/	Wallstreet	
41	Fullz	February-18	Real Fresh US Profiles+email+SSN+DOB	Partial Fullz	\$1.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-feb-2018-us/	Wallstreet	
42	Fullz	February-18	Fullz - "online payment services, for Fullz info is an information bundle that includes a name, SSN, DOB, Account number and other data." Range value \$10 - \$30.	Fullz with Financial Information	\$20.00	Texas Data Solutions	Shining A Light On The Dark Web_ How Mu...pdf, Accessed 3/21/19	N/A	
43	Fullz	March-18	Full Identity Profile including: SSN, DOB, Address, Phone Numbers, Education Level and Employment Info.	Fullz	\$40.00	Armor	https://cdn.armor.com/app/uploads/2018/03/27222933/2018-Q1-Reports-BlackMarket-DIGITAL-min.pdf	N/A	
44	Fullz	April-18	Fullz	Fullz	\$8.00	Lifelock	https://www.lifelock.org/value-personal-info-much-identity-worth/	N/A	
45	Fullz	June-18	USA Fullz Including First Name, Last Name, Current Home/billing address, Previous Home/billing address, City, State, Zip, Country, Mobile and/or home phone, Work phone, SSN, DOB, Mother's Maiden Name, Credit Card number.	Fullz with Financial Information	\$24.33	Armor	Cybercriminals Profit as Stolen Credit ...pdf, Accessed 3/21/19.	N/A	

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Summary of "Fullz" Information Market Values on the Dark Web

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46	SSN	September-18	SSN of a specific person	SSN	\$2.99	AARP	https://www.aarp.org/money/scams-fraud/info-2018/what-is-the-dark-web.html	N/A	
47	Fullz	September-18	SSN, DOB, Mother's Maiden Name, Address, Phone numbers, Driver's License, Etc. Price range from \$20 - \$130.	Fullz	\$75.00	AARP	https://www.aarp.org/money/scams-fraud/info-2018/what-is-the-dark-web.html	N/A	
48	SSN	October-18	SSN	SSN	\$2.99	The Issues	Identity Fraud And The Dark Web - [FKD].pdf, Accessed 3/21/19	N/A	
49	Fullz	October-18	Fullz (SSN, Credit card numbers, logins, passwords, DOB, addresses, phone numbers, MMN and DL numbers) Range from \$20 to \$100.	Fullz with Financial Information	\$60.00	The Issues	Identity Fraud And The Dark Web - [FKD].pdf, Accessed 3/21/19	N/A	
50	Fullz	December-18	Fullz "complete credit report"	Fullz with Financial Information	\$100.00	Recorded Future	https://www.wsj.com/articles/what-happens-to-your-data-after-a-hack-1544367600	N/A	
51	SSN	December-18	SSN of a random person	SSN	\$0.05	Recorded Future	https://www.wsj.com/articles/what-happens-to-your-data-after-a-hack-1544367600	N/A	
52	SSN	December-18	SSN of a specific person	SSN	\$3.00	Recorded Future	https://www.wsj.com/articles/what-happens-to-your-data-after-a-hack-1544367600	N/A	
53	Fullz	December-18	Fullz "credit card and personal information"	Fullz with Financial Information	\$24.00	Armor Defense	WSJ Article Note.pdf, Accessed 3/21/19.	N/A	
54	Fullz	February-19	Custom Fullz with Credit Report	Fullz with Financial Information	\$119.60	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Dream	
55	Fullz	February-19	USA Fullz with credit score 750+, 25-30 year old.	Fullz with Financial Information	\$104.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Dream	
56	Fullz	February-19	Only male US SSN, DL, DOB, email, FICO	Fullz with Financial Information	\$60.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	
57	Fullz	February-19	Fullz Female, 750+ credit & BG/SSN, MMN, DL + exp.	Fullz with Financial Information	\$45.71	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Dream	
58	Fullz	February-19	Fullz Missouri (M). Score 700-800+, DL + exp, MMN	Fullz with Financial Information	\$45.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	
59	Fullz	February-19	US Latin Names - SSN, DL, POA, email, FICO	Fullz with Financial Information	\$40.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	
60	Fullz	February-19	High Credit USA Fullz GUARANTEED +800	Fullz with Financial Information	\$36.50	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Empire	
61	Fullz	February-19	FULLZ CREDIT PROFILE, Background REPORT, TA	Fullz with Financial Information	\$36.40	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Dream	
62	Fullz	February-19	FULLZ W/Credit Score, Driver's License Scan &...	Fullz with Financial Information	\$31.20	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Dream	
63	Fullz	February-19	FULLZ W/ DRIVER LICENSE SCAN	Fullz	\$26.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Dream	
64	Fullz	February-19	HQ US Fullz - Credit Report with 700+SSN DOB	Fullz with Financial Information	\$20.99	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Empire	

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65	Fullz	February-19	CHEAPEST HIGH QUALITY USA FULLZ - SSN, DOB, CREDI...	Fullz with Financial Information	\$20.80	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Dream	
66	Fullz	February-19	USA Space Business Fullz EIN Credit report	Fullz with Financial Information	\$20.80	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Dream	
67	Fullz	February-19	Ultra HQ Random USA Fullz	Fullz	\$16.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Empire	
68	Fullz	February-19	Complete USA Fullz -700	Fullz with Financial Information	\$15.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Empire	
69	Fullz	February-19	SUPER FULLZ WITH EMAIL ACCESS USA ONLY	Fullz	\$13.93	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Berlusconi	
70	Fullz	February-19	MO & CA Loan Fullz	Fullz with Financial Information	\$13.68	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	
71	Fullz	February-19	VHQ UK Fullz	Fullz	\$11.96	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Dream	UK
72	Fullz	February-19	SSN + DoB	Partial Fullz	\$11.40	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Berlusconi	
73	Fullz	February-19	US Fullz w DL number	Fullz	\$10.40	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Dream	
74	Fullz	February-19	Quality US Fullz (SSN-DOB-DL & MORE)\$10	Partial Fullz	\$10.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Empire	
75	Fullz	February-19	FULL INFO US (DOB SSN, Documents number)	Partial Fullz	\$9.99	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Empire	
76	Fullz	February-19	Premium Profiles USA FULLZ	Fullz	\$7.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Empire	
77	Fullz	February-19	Cheapest SSN & DOB \$0.2 each!!	Partial Fullz	\$5.20	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Dream	[1]
78	Fullz	February-19	FULLZ - SSN - DOB	Partial Fullz	\$5.20	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Dream	
79	Fullz	February-19	SSN/DOB OF USA	Partial Fullz	\$5.19	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Dream	
80	Fullz	February-19	UK DEAD FULLZ	Fullz	\$5.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Empire	UK
81	Fullz	February-19	USA FULLZ with SSN, D.O.B. and DRIVERS LICENSE W/ Scans	Partial Fullz	\$5.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	
82	Fullz	February-19	USA ARMY FULLZ	Fullz	\$5.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Empire	
83	Fullz	February-19	USA FULL NAME DOB SSN ADDRESS	Partial Fullz	\$5.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Tochka	
84	Fullz	February-19	USA - Personal info / SSN	Partial Fullz	\$4.56	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Berlusconi	
85	Fullz	February-19	Full info, only valid info SSN, DOB, New Mexico sta...	Partial Fullz	\$3.12	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Dream	
86	Fullz	February-19	USA fullz Social Security Number and Date of Birth	Partial Fullz	\$2.99	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	
87	Fullz	February-19	Personal Information SSN - DOB, etc.	Partial Fullz	\$2.93	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Berlusconi	
88	Fullz	February-19	Real Persons Documents (ID, DL, Passport) see full list	Fullz	\$2.17	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Berlusconi	

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	Type of Account	Date	Market Item Description/Article's Item Description	Category	Price/Value on Dark Web per User Account	Publication	Source / Additional Information	Market	Notes
89	Fullz	February-19	USA FULL (NAME DOB SSN ADDRESS)	Partial Fullz	\$2.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Tochka	
90	Fullz	February-19	Fresh USA Full SSN-DOB Instant Shipping	Partial Fullz	\$2.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	
91	Fullz	February-19	Fresh USA Full SSN-DOB Instant Shipping	Partial Fullz	\$2.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	
92	Fullz	February-19	HQ Random Fullz US SSN/DOB with Marital Profile	Partial Fullz	\$2.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	
93	Fullz	February-19	FRESH USA FULLZ - \$1.5 each	Fullz	\$1.50	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Empire	
94	Fullz	February-19	USA FULLZ SSN+DOB+DL+BG+CR	Fullz with Financial Information	\$1.04	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Dream	
95	Fullz	February-19	California State Random Fullz \$0.75 (Auto-Dispatch only) 1950 - 1990	Fullz	\$1.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Empire	
96	Fullz	February-19	New York City Fullz (Auto dispatch only) Random Dobb , Gender , County	Fullz	\$1.00	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Empire	
97	Fullz	February-19	FRESH USA FULLZ (SSN+DOB) \$1	Partial Fullz	\$0.99	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Empire	
98	Fullz	February-19	Random State fullz (Cheapest on Empire Autodispatch) 1940 - 1990	Fullz	\$0.75	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Empire	
99	Fullz	February-19	US FULLZ INFO SSN+DOB MISSOURI (MO) \$0.49	Partial Fullz	\$0.49	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	
100	Fullz	February-19	US SSN + DOB Minnesota (MN) \$0.49	Partial Fullz	\$0.49	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	
101	Fullz	February-19	US SSN + DOB Oklahoma (OK) \$0.19 SALE	Partial Fullz	\$0.19	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	
102	Fullz	February-19	US SSN + DOB Idaho (ID) \$0.19	Partial Fullz	\$0.19	Top10VPN	https://www.top10vpn.com/news/privacy/dark-web-market-price-index-2019-us-edition/	Wallstreet	
103	Fullz	March-19	SSN, name, DOB, account numbers	Fullz with Financial Information	\$30.00	Experian	https://www.experian.com/blogs/ask-experian/heres-how-much-your-personal-information-is-selling-for-on-the-dark-web/	N/A	
104	SSN	March-19	SSN	SSN	\$1.00	Experian	https://www.experian.com/blogs/ask-experian/heres-how-much-your-personal-information-is-selling-for-on-the-dark-web/	N/A	
105	SSN	2019	SSN "Your SSN can sell for as little as \$1"	SSN	\$1.00	VOX & Creditwise	https://www.theverge.com/ad/18283053/how-much-does-social-security-sell-for-on-dark-web	N/A	
106	SSN	2019	SSN Range from \$1 to \$8.	SSN	\$4.50	Truthfinder	https://www.truthfinder.com/dark-web/	N/A	
107	Fullz	2019	US Fullz - Bulk Sales Only. Insurance Company Database. Good or Excellent Credit. Name, Address, Phone #, DL#, SSN, DOB, Bank Name, Routing #, Checking Acct #, Draft date for auto monthly payment, Medical Records. 5 = \$40	Fullz with Financial Information	\$8.00	Truthfinder	https://www.truthfinder.com/dark-web/	N/A	Bulk
108	Fullz	2019	US Fullz - Bulk Sales Only. Insurance Company Database. Good or Excellent Credit. Name, Address, Phone #, DL#, SSN, DOB, Bank Name, Routing #, Checking Acct #, Draft date for auto monthly payment, Medical Records. 10 = \$70	Fullz with Financial Information	\$7.00	Truthfinder	https://www.truthfinder.com/dark-web/	N/A	Bulk
109	Fullz	2019	US Fullz - Bulk Sales Only. Insurance Company Database. Good or Excellent Credit. Name, Address, Phone #, DL#, SSN, DOB, Bank Name, Routing #, Checking Acct #, Draft date for auto monthly payment, Medical Records. 15 - \$110	Fullz with Financial Information	\$7.30	Truthfinder	https://www.truthfinder.com/dark-web/	N/A	Bulk

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110	Fullz	2019	US Fullz - Bulk Sales Only. Insurance Company Database. Good or Excellent Credit. Name, Address, Phone #, DL#, SSN, DOB, Bank Name, Routing #, Checking Acct #, Draft date for auto monthly payment, Medical Records. 20 = \$140	Fullz with Financial Information	\$7.00	Truthfinder	https://www.truthfinder.com/dark-web/	N/A	Bulk
111	Fullz	2019	US Fullz - Bulk Sales Only. Insurance Company Database. Good or Excellent Credit. Name, Address, Phone #, DL#, SSN, DOB, Bank Name, Routing #, Checking Acct #, Draft date for auto monthly payment, Medical Records. 30 = \$210	Fullz with Financial Information	\$7.00	Truthfinder	https://www.truthfinder.com/dark-web/	N/A	Bulk
112	Fullz	2019	US Fullz - Bulk Sales Only. Insurance Company Database. Good or Excellent Credit. Name, Address, Phone #, DL#, SSN, DOB, Bank Name, Routing #, Checking Acct #, Draft date for auto monthly payment, Medical Records. 40 = \$280	Fullz with Financial Information	\$7.00	Truthfinder	https://www.truthfinder.com/dark-web/	N/A	Bulk
113	Fullz	2019	US Fullz - Bulk Sales Only. Insurance Company Database. Good or Excellent Credit. Name, Address, Phone #, DL#, SSN, DOB, Bank Name, Routing #, Checking Acct #, Draft date for auto monthly payment, Medical Records. 50 = \$320	Fullz with Financial Information	\$6.40	Truthfinder	https://www.truthfinder.com/dark-web/	N/A	Bulk

	Fullz and Partial Fullz Market Summary Statistics		
	Fullz	Fullz with Financial	Partial Fullz
Min	\$0.75	\$1.00	\$0.19
Max	\$75.00	\$150.00	\$20.80
Mean	\$19.48	\$37.77	\$4.41
Median	\$14.97	\$31.20	\$3.00

Notes:

[1] The value of this PII is unclear as Top10vpn concluded \$5.20, but the text says \$0.20.

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Calculation of Facebook Data Security Labor Rate

Facebook Cost Center	2017			2018		
	Payroll Expenses	Headcount	Average Salary	Payroll Expenses	Headcount	Average Salary
Infra(Privacy and Data Use)	\$0		\$0	\$5,477,668	38	\$144,149
Infra ENG(Privacy and Data Use)	0		0	16,673,107	84	198,489
Infra(Security)	10,242,633	38	269,543	10,625,409	41	259,156
Infra ENG(Security)	31,753,413	142	223,616	31,619,595	136	232,497
Privacy Policy	0		0	8,461,103	43	196,770
Infra Network Security	1,812,723	7	258,960	2,503,126	10	250,313
PHYSICAL SECURITY	1,981,556	9	220,173	4,003,974	19	210,735
Total	\$45,790,325	196	\$233,624	\$79,363,983	371	\$213,919

Notes:

[1] FB-SCHMIDT-000055931.

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Calculation of Annual Facebook Data Security Spend

Cost Center	2017 Actual	2018 Budget	2018 Actual	2019 Budget
Infra(Privacy and Data Use)	\$0	\$7,029,067	\$7,108,576	\$39,512,680
Infra ENG(Privacy and Data Use)	0	15,399,159	21,458,040	68,738,984
Infra(Security)	21,146,486	29,793,519	27,485,493	34,220,273
Infra ENG(Security)	65,118,393	99,661,066	78,667,703	82,326,002
Privacy Policy	0	5,990,573	15,032,752	46,000,474
Infra Network Security	1,812,723	2,921,499	2,503,126	9,490,419
PHYSICAL SECURITY	27,163,838	48,685,000	53,692,663	59,287,702
Total	\$115,241,440	\$209,479,884	\$205,948,353	\$339,576,534

Notes:

[1] FB-SCHMIDT-000055931.

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Formula for Calculating Time Spent Dealing with the Data Breach Announcement

Steps Data Breach Victims Should Take: ^[1]							
1 Research the Data Breach 2 Change Passwords 3 Check Credit Reports 4 Actively Monitor Accounts 5 Obtain Identity Theft Protection 6 File Taxes Early							
	1	2	3	4	5	6	
Class Member	Researching Facebook Data Breach	Resetting Passwords	Check Credit Reports	Monitor Accounts	Obtain Identity Theft Protection	File Taxes Early	Total
Adkins	60	3	0	45	0	0	108
Total time (minutes)	60	3	0	45	0	0	108
Hours							<u>1.80</u>

Notes:

[1] See, for example, <https://www.lifelock.com/learn-data-breaches-steps-to-take-right-after-a-data-breach.html> and <https://www.daveramsey.com/blog/data-breach-impacts>.

[2] Adkins deposition, pp. 204, 243,244, and 422-424. Note, as part of the monitoring process, Mr. Adkins determined it necessary to cancel one of his credit cards.